

Die Vorhersage von Migrationsbewegungen mittels Prognosemarkt

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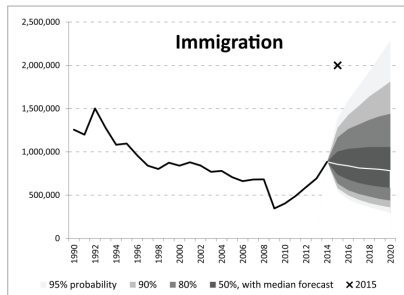
DeZIM Research Seminar, Mai 2021

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- Prediction markets
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Predicting Migration Movements

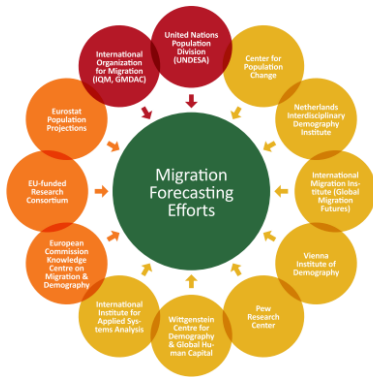
- Relevant for proactive migration politics
- Increasing demand for more accurate forecasts



GMDAC, Data briefing 2016:
Immigration to Germany

Predicting Migration Movements – State of the Art

- Variety of attempts exist (Sohst et al. 2020, Sardoschau 2020)
- Variety of challenges to face
 - ▶ Quality and uncertainty of the underlying data
 - ▶ Complexity of key drivers of migration
 - ▶ Sensitivity to short-term shocks



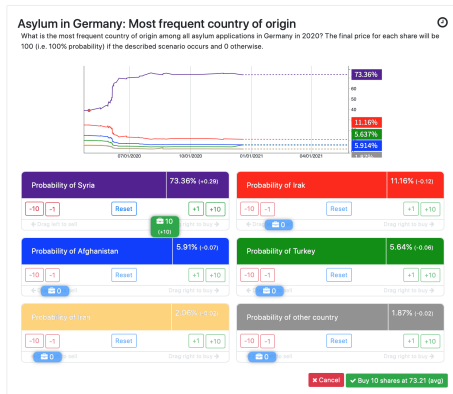
DeZIM, S.Sardoschau 2020

Alternative Prediction Method: Prediction Markets

- Prediction markets can be applied to all kinds of *events*
- Like stock markets: Instead of trading financial products we trade *outcomes of events*
- Buying or selling shares of outcomes of events is equivalent to a bet on the outcome
- Prediction markets are mostly used for forecasting elections in academia (own application to Germany, Switzerland, Spain, and USA)

Prediction markets: Step by step

- Step 1: The organizer sets a starting price for each share.
- Step 2: Participants trade the share.
- Step 3: The final price of the share is decided based on the outcome of the event.
- Here: If the event takes place, the final value is set to 1. If it does not take place it is set to 0.
- It follows: The price of a share reflects the (weighted average) expected probability.



Prediction markets: Why they work

- Focus on the event that has to be predicted
- Aggregate all available information
- Aggregate decentralized information
- Price as efficient aggregation mechanism
- Price is weighted by the uncertainty of the participants
- No speculation bubbles if restricted to short time periods

Prediction markets: Comparison with other methods

- Expert panels: Few time points, not weighted, lack of incentives
- Focus groups: Problem of opinion leaders
- Quantitative models: Lack of available information
- Citizen surveys: Few time points, lack of expert knowledge

Prediction markets: Challenges and solutions

- Enough information:
 - ▶ Crowds (the usual solutions)
 - ▶ Experts

- Thin trading (“low participation”):
 - ▶ Also non-experts
 - ▶ Financial incentives (but ethical issues)
 - ▶ Automated market maker (central bank)

Study Design: Apply Prediction Market to Migration Movements

- Pilot Study 2020
- Topics
 - ▶ Asylum: Most frequent country of origin in 2020
 - ▶ Asylum: Applications 2020
 - ▶ Immigration 2020
- Countries
 - ▶ UK
 - ▶ Switzerland
 - ▶ Spain
 - ▶ Germany

Asylum applications in the UK 2020

How many asylum applications will be submitted in the United Kingdom in 2020 (2019: 35.566)? The final price for each share will be 100 (i.e. 100% probability) if the described scenario occurs and 0 otherwise.

■ Probability of 45k or more	3.96%
■ Probability of 40 - 44k	10.86%
■ Probability of 35 - 39k	36.22%
■ Probability of 30 - 34k	31.12%
■ Probability of less than 30k	17.83%

[Trade shares](#)

Migration to Germany 2020

How many individuals without German citizenship will migrate to Germany in 2020 (2019: 1.361.880)? The final price for each share will be 100 (i.e. 100% probability) if the described scenario occurs and 0 otherwise.

■ Probability of 1.40 mn. or more	8.37%
■ Probability of 1.20 - 1.39 mn.	23.21%
■ Probability of 1.00 - 1.19 mn.	46.44%
■ Probability of 0.80 - 0.99 mn.	13.06%
■ Probability of less than 0.80 mn.	8.93%

[Trade shares](#)

Study Design: Ethical Considerations

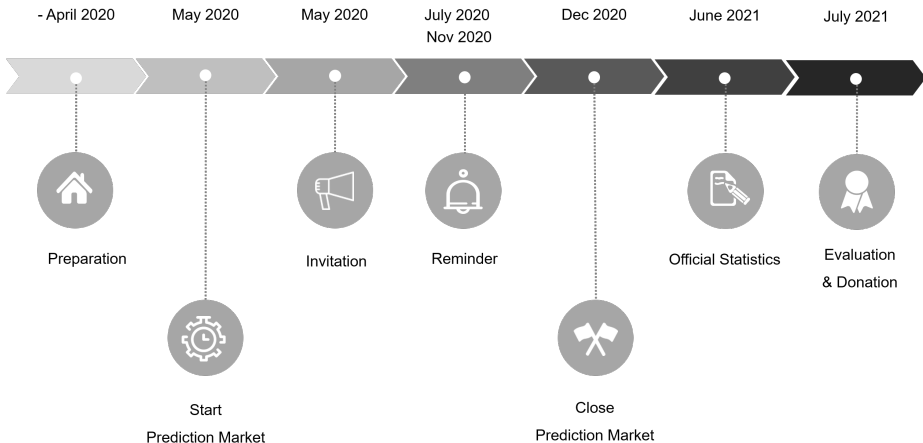
- Intentions behind study and impact of study for society
- Invasiveness for subjects and/or sample under study
- Incentives for participation
 - ▶ Monetary logic / financial incentives supported (Luckner/Weinhardt 2007)
 - ▶ Financial incentive = Incentive to influence actual migration movements
 - ▶ Profits earned are not reimbursed but donated to a humanitarian organisation

Study Design: Sample

- Combination of expert sample and experienced crowd
 - ▶ Experts from NGOs, Governments, Academia
 - ▶ Experts from potential sending countries and receiving countries

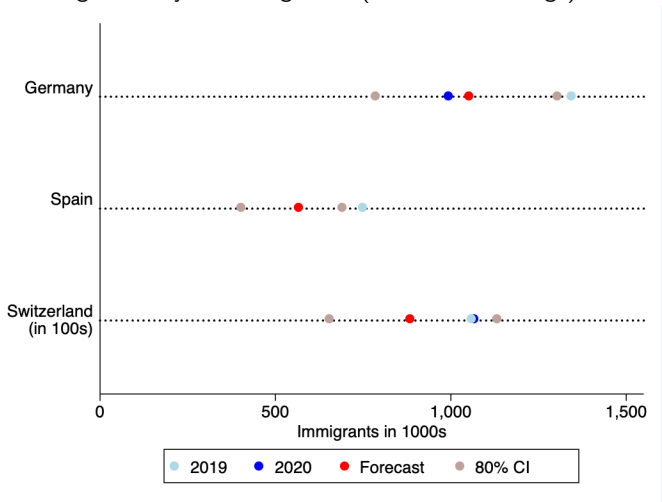
- Quantity of sample
 - ▶ Literature/experience minimum 30-50 participants
 - ▶ N = 166 participants

Study Design



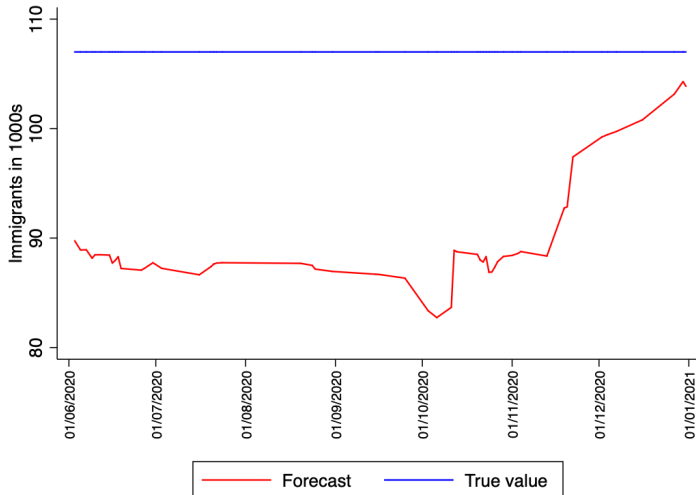
First Results

Forecasting accuracy for immigration (June 2020, average)



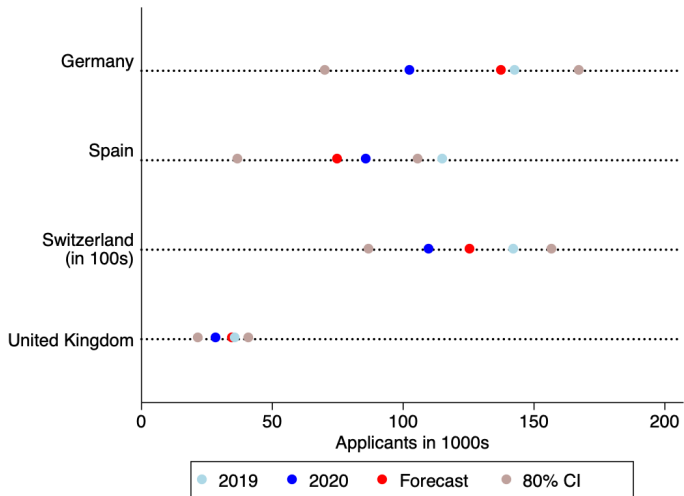
First Results

Forecasting accuracy for immigration to Switzerland over time



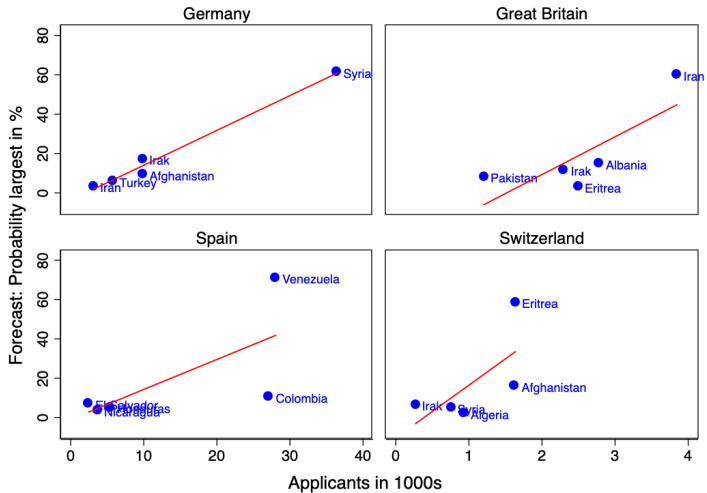
First Results

Forecasting accuracy for asylum applications (June 2020, average)



First Results

Forecasting accuracy for origin of asylum applicants (June 2020, average)



Outlook

- Successful pilot: Migration flows can be forecasted with prediction markets!
- Larger panel and more engagement will improve forecasts
- Beyond forecasting: Analysis of effect of expectations on policies, discourse, etc.
- Next version of the project
 - ▶ Extend countries
 - ▶ Extend topics
 - ▶ Monthly forecasts
- Next steps: Collaborations, funding

Thank you.

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