Predictors of AfD party success in the 2017 elections

A Bayesian modeling approach

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FOM
DGPs 2018

Menace to society

Right-wing populism then and now

Causes of 20th century world wars

- Perceived in-group superiority (nationals, racism, antizionism)

- (Perceived) injustice and inequality

- Autocrats as political leaders

Source: Kershaw, I. (2016). To hell and back: Europe 1914-1949. New York City, NW: Penguin.

Right-wing populism varies greatly, but...

Source: https://pixabay.com/photos/audience-crowd-people-persons-828584/ Pixabay Licence

# AfD as a nucleus of the German right-wing movement?

Popular theories on AfD success

Populist party support is fueled by ...

- weak economy ("rust belt hypothesis") 🏭

- high immigration ("flooding hypothesis") 🚶

- cultural patterns ("Saxonia hypothesis") 🚩

Source: Franz, Christian; Fratzscher, Marcel; Kritikos, Alexander S. (2018) : German right-wing party AfD finds more support in rural areas with aging populations, DIW Weekly Report, ISSN 2568-7697, Deutsches Institut für Wirtschaftsforschung (DIW), Berlin, Vol. 8, Iss. 7/8, pp. 69-79
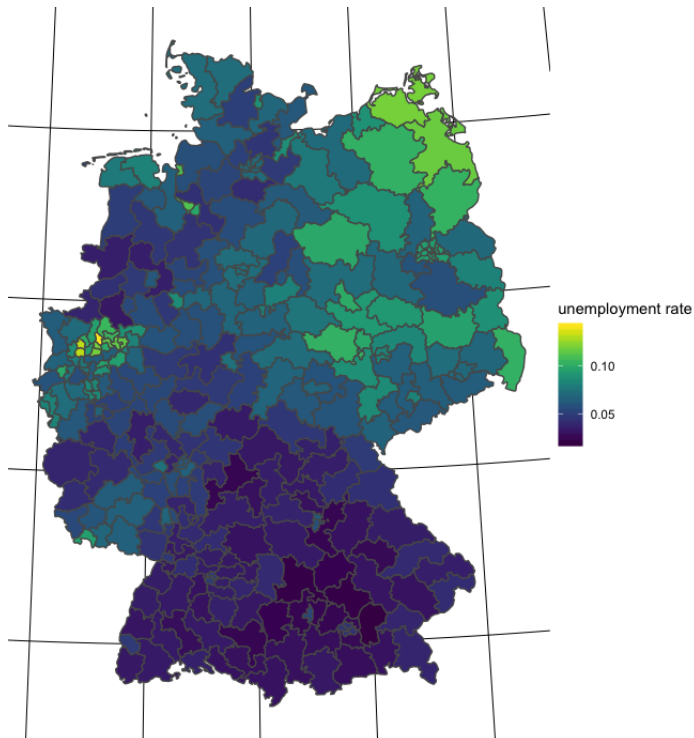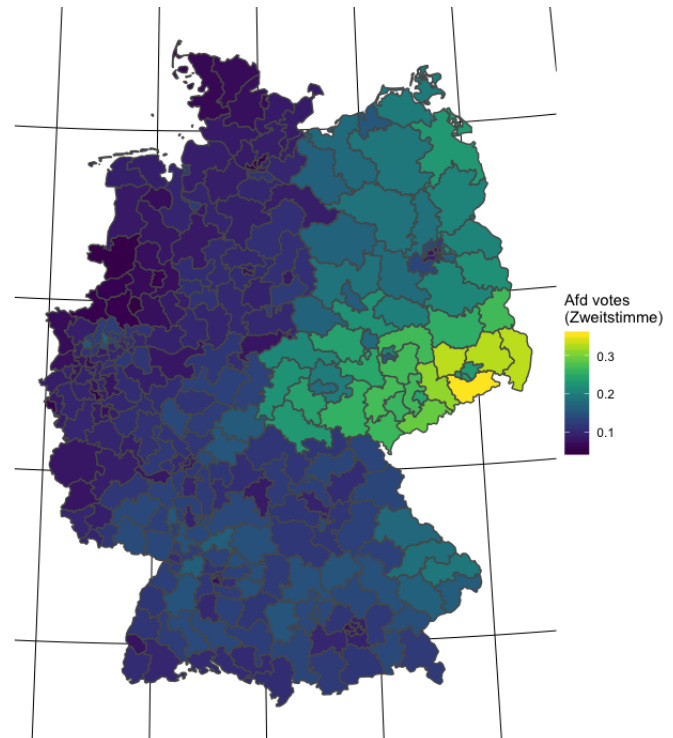
Our research model
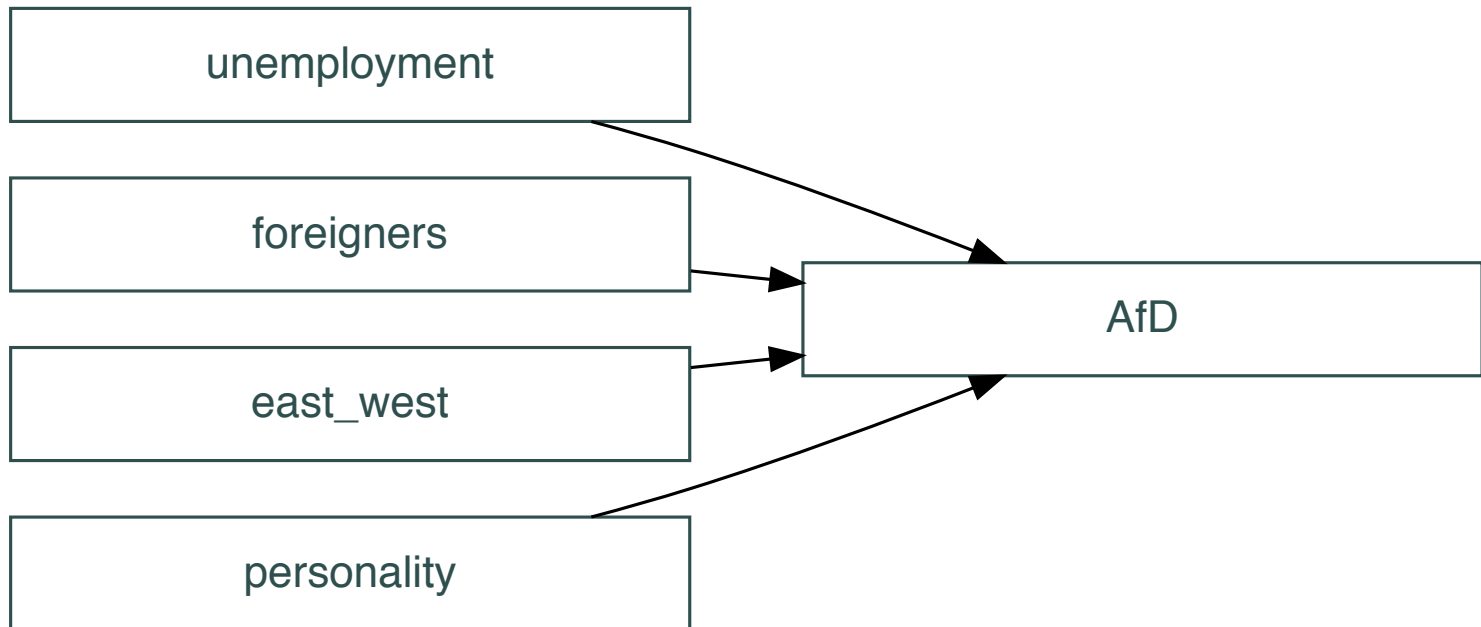
AfD votes, and socioenomic factors at the Bundestagswahl 2017
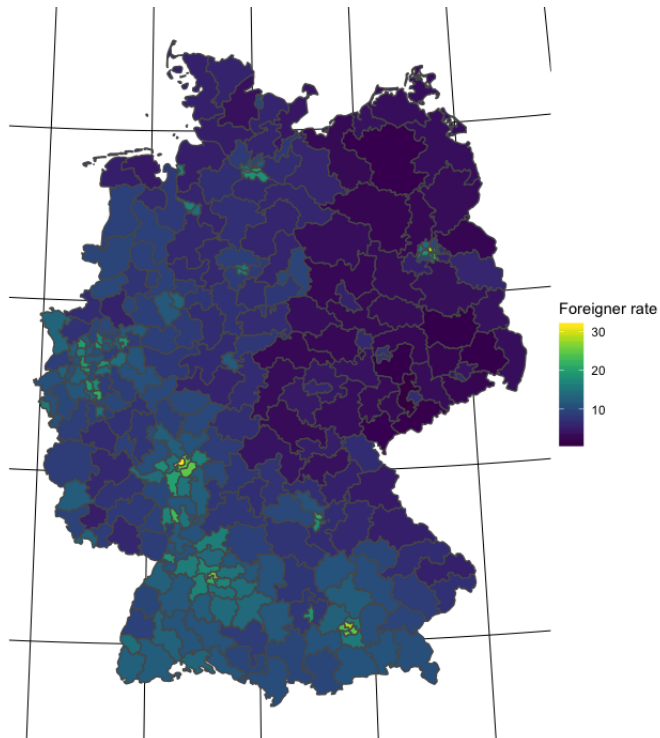
Unemployment and AfD votes

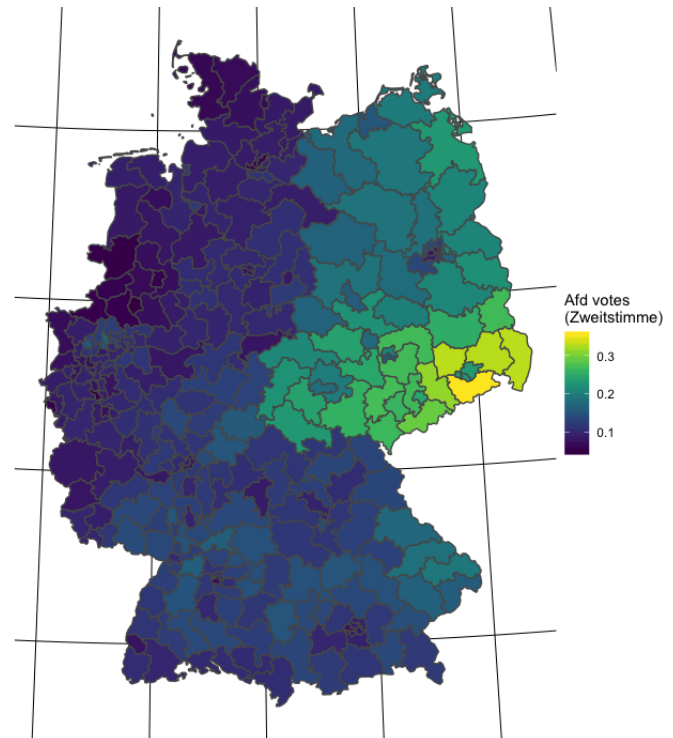Data provided by the Bundeswahlleiter 2017

Data provided by the Bundeswahlleiter 2017

Foreigners and AfD votes

Data provided by the Bundeswahlleiter 2017

Data provided by the Bundeswahlleiter 2017

data analysis

Data preparation

- Election related data were obtained from Bundeswahlleiter 2017

- Personality data (n = 12444) were collected by the authors

- Some ZIP codes could not be matched to electoral districts

- Data and analysis are accessible at Github:
  https://github.com/sebastiansauer/afd_values

- Outcome variable: `afd_votes` (proportion) was log-transformed for better approximation to normality
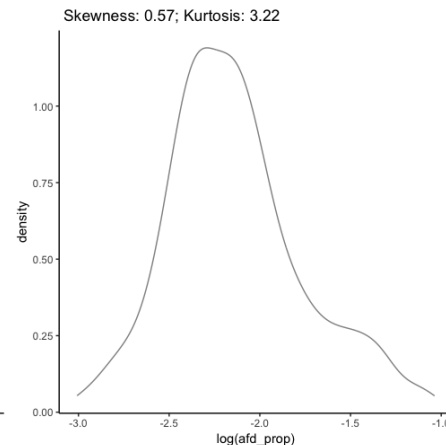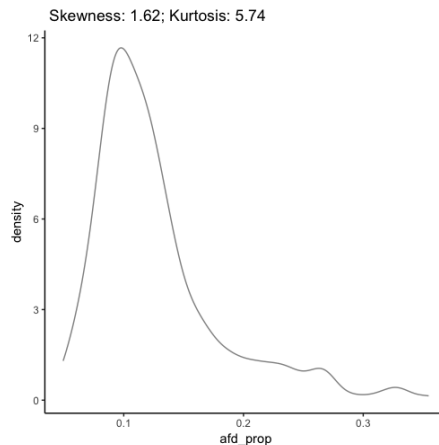
Bayes modeling

- Stan via the R packages `rstan` and `rethinking`

- Hamiltonian Markov Chain Monte Carlo (MCMC)

- 2000 iterations, 2 chains, 1/2 burn-in

- Multi level regression modeling (varying intercepts)

- The WAIC was used for to compare model performance:

    - is an estimate for *out-of-sample* model performance
    - based on information theory
    - WAIC is similar to the AIC but less restrictive

Guideline: McElreath, R. (2016). Statistical rethinking. New York City, NY: Apple Academic Press Inc.

Model specification

```
# Likelihood:
afd_prop_log_z ~ dnorm(mu, sigma),

# regression:
mu <- beta0[state_id] + beta1*for_prop_z     + beta2*unemp_prop_z +
  beta3*enjoyer        + beta4*harmony_seeker + beta5*self_determined
  beta6*appreciater    + beta7*conformist     + beta8*type_unknown +
  beta9*responsibility_denier,

# priors:
sigma  ~ dcauchy(0, 1),
beta1  ~ dnorm(0, 1), beta2 ~ dnorm(0, 1), beta3 ~ dnorm(0, 1),
beta4  ~ dnorm(0, 1), beta5 ~ dnorm(0, 1), beta6 ~ dnorm(0, 1),
beta7  ~ dnorm(0, 1), beta8 ~ dnorm(0, 1), beta9 ~ dnorm(0, 1),
beta0[state_id] ~ dnorm(0, sigma2),  # multi level
sigma2 ~ dcauchy(0, 1)
```
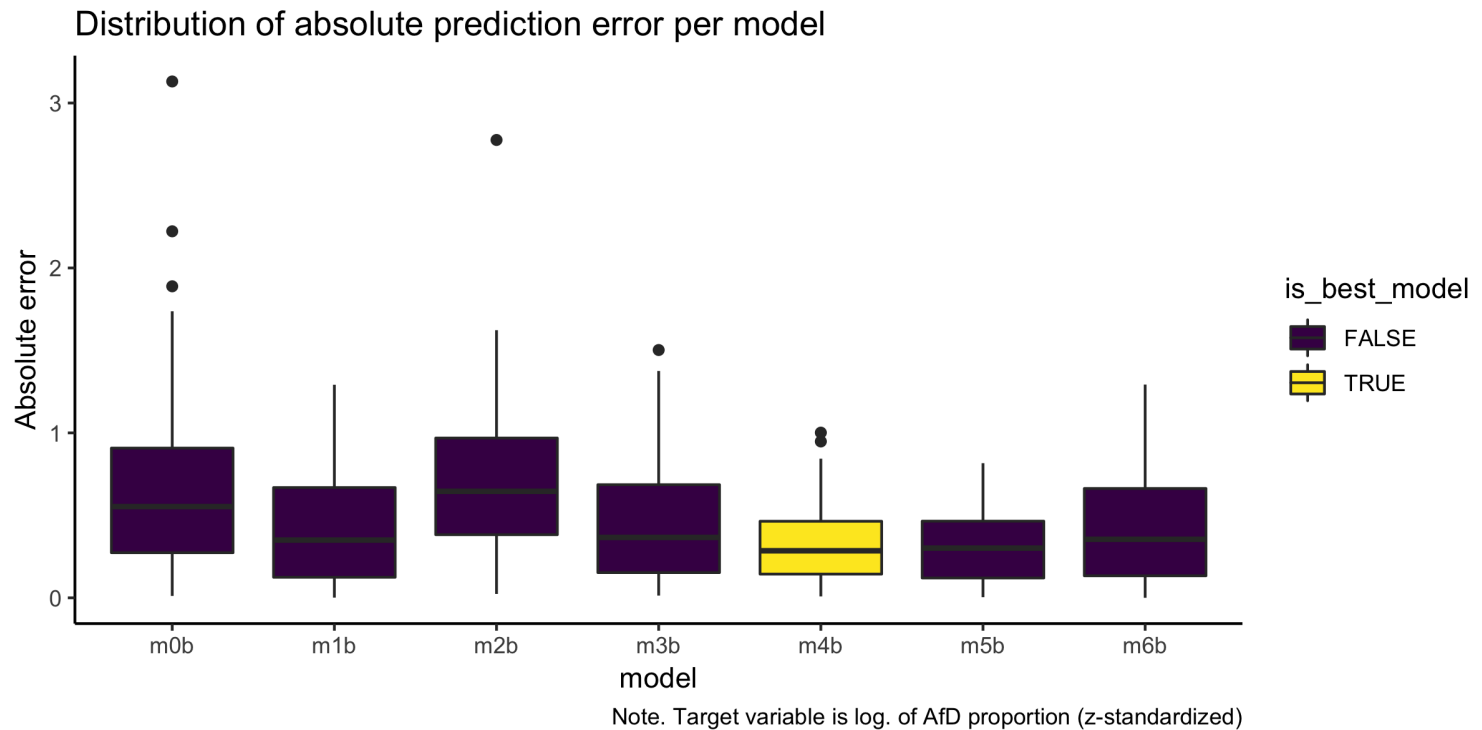
Results: Model comparison

State is the strongest predictor

model	predictors	WAIC	pWAIC	SE	weight
m4b	**state (ML) + foreign + unemp**	**106.04**	**12.78**	**11.32**	**0.79**
m5b	state (ML) + foreign + unemp + personality	108.66	15.56	10.69	0.21
m1b	east + foreign + unemp + personality	144.45	7.39	12.13	0.00
m6b	east (ML) + foreign + unemp + personality	145.04	7.58	12.00	0.00
m3b	east (ML) + foreign + unemp	153.80	4.84	12.50	0.00
m7b	personality	205.99	4.27	14.47	0.00
m8b	personality without type 'unknown'	206.93	3.33	15.98	0.00
m2b	east + foreign + unemp	209.29	4.72	13.54	0.00
m0b	null model	209.53	2.46	16.39	0.00

ML: Multi Level

Comparing model errors

Distribution of absolute prediction error per model

Note. Target variable is log. of AfD proportion (z-standardized)
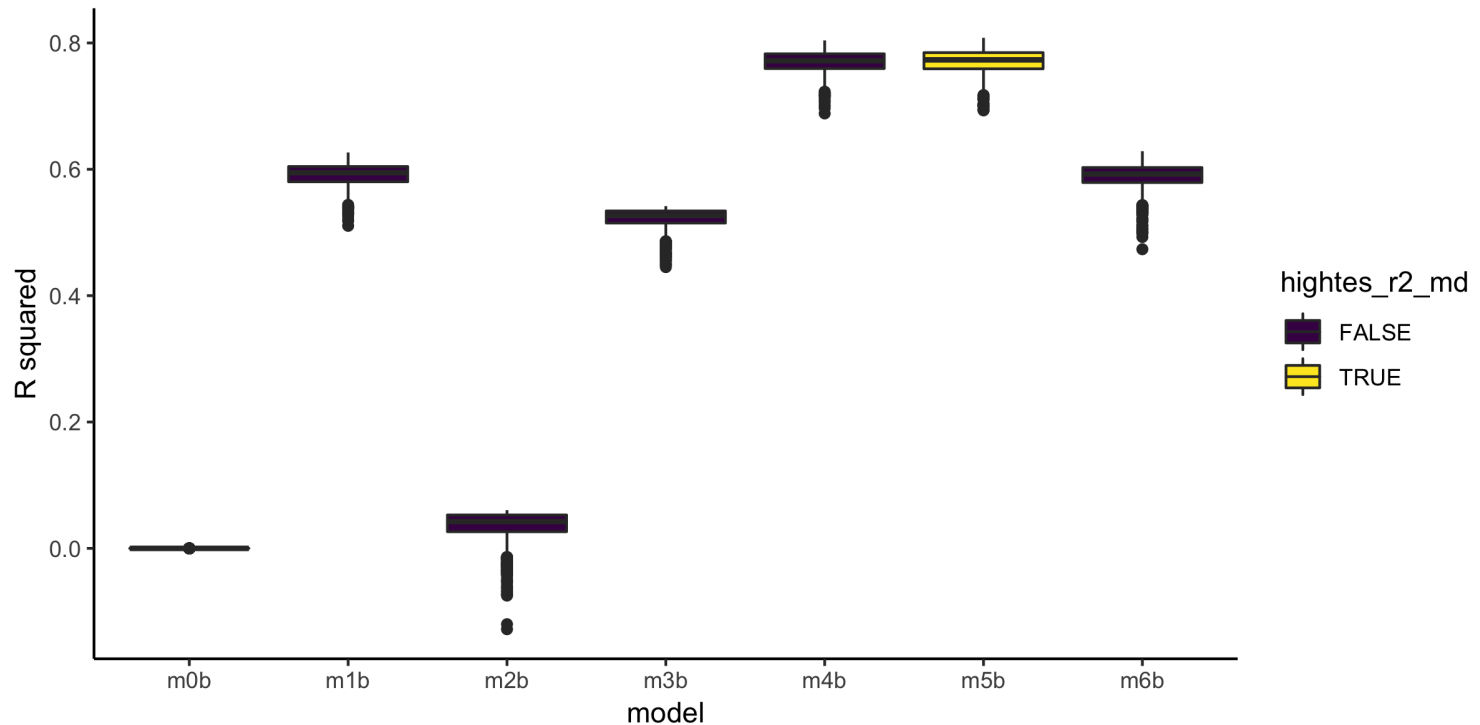
R squared estimates for each model

Beware: Unadjusted R^2 estimates, prone to overfitting

Results: Most favorable model

Model specification of most favorable model

Model predictors: state (as multi level) + foreign + unemp

```
# Likelihood:
afd_prop_log_z ~ dnorm(mu, sigma),

# regression:
mu <- beta0[state_id] +  beta1*for_prop_z + beta2*unemp_prop_z,

#priors:
beta0[state_id] ~ dnorm(0, sigma2),

sigma  ~ dcauchy(0, 1),
sigma2 ~ dcauchy(0, 1),
beta1  ~ dnorm(0, 1),
beta2  ~ dnorm(0, 1)
```
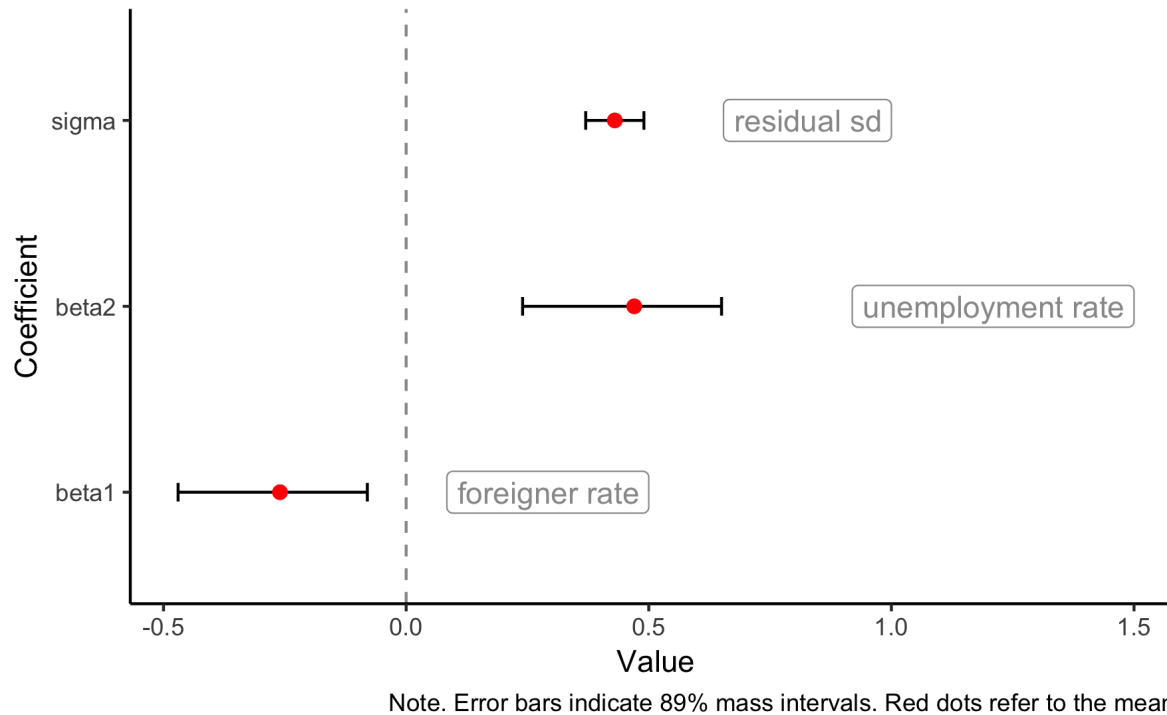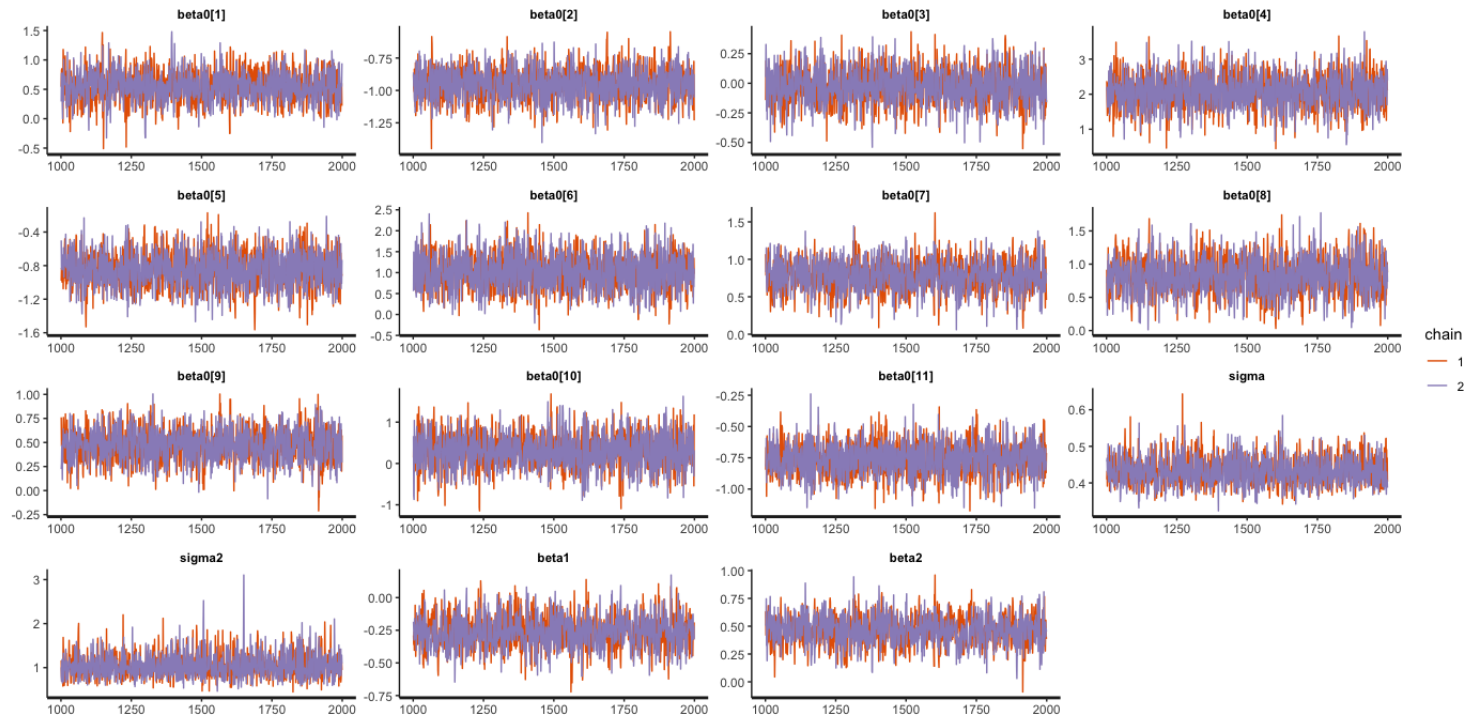
Coefficients of the most favorable model

Model predictors: state (as multi level) + foreign + unemp

Note. Error bars indicate 89% mass intervals. Red dots refer to the mean.
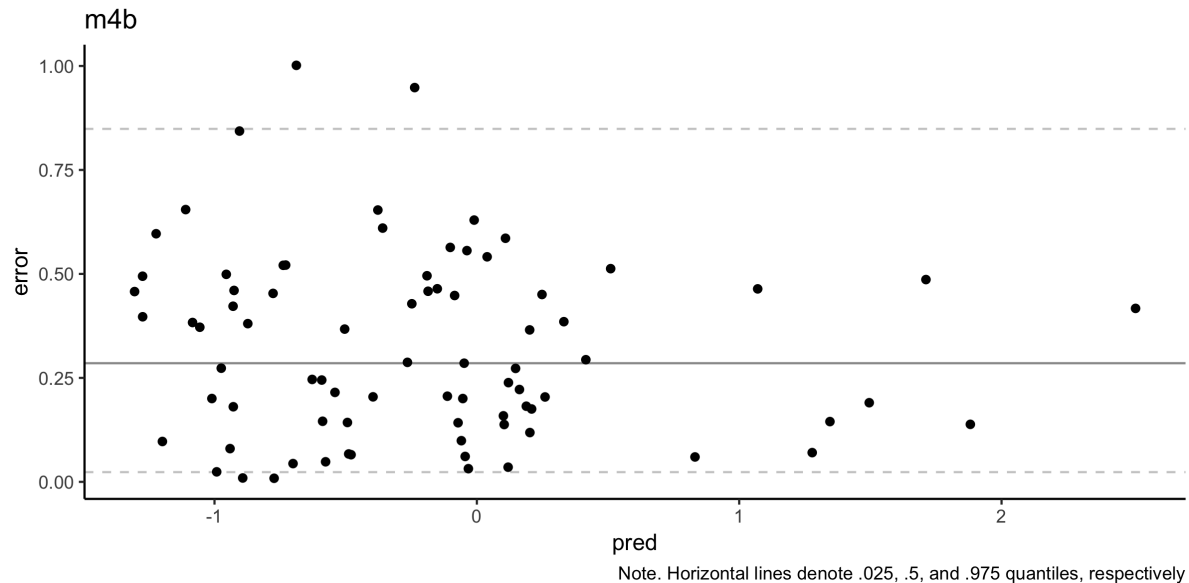
Only level 1 coefficients are shown.

Big fat hairy catterpillars, as it should be

Model predictors: state (as multi level) + foreign + unemp

Model additivity assumption of best model

Model predictors: state (as multi level) + foreign + unemp

Note. Horizontal lines denote .025, .5, and .975 quantiles, respectively

Gelman, A., & Hill, J. (2006). Data analysis using regression and multilevel/hierarchical models. Cambridge university press.

Posterior distributions of best model

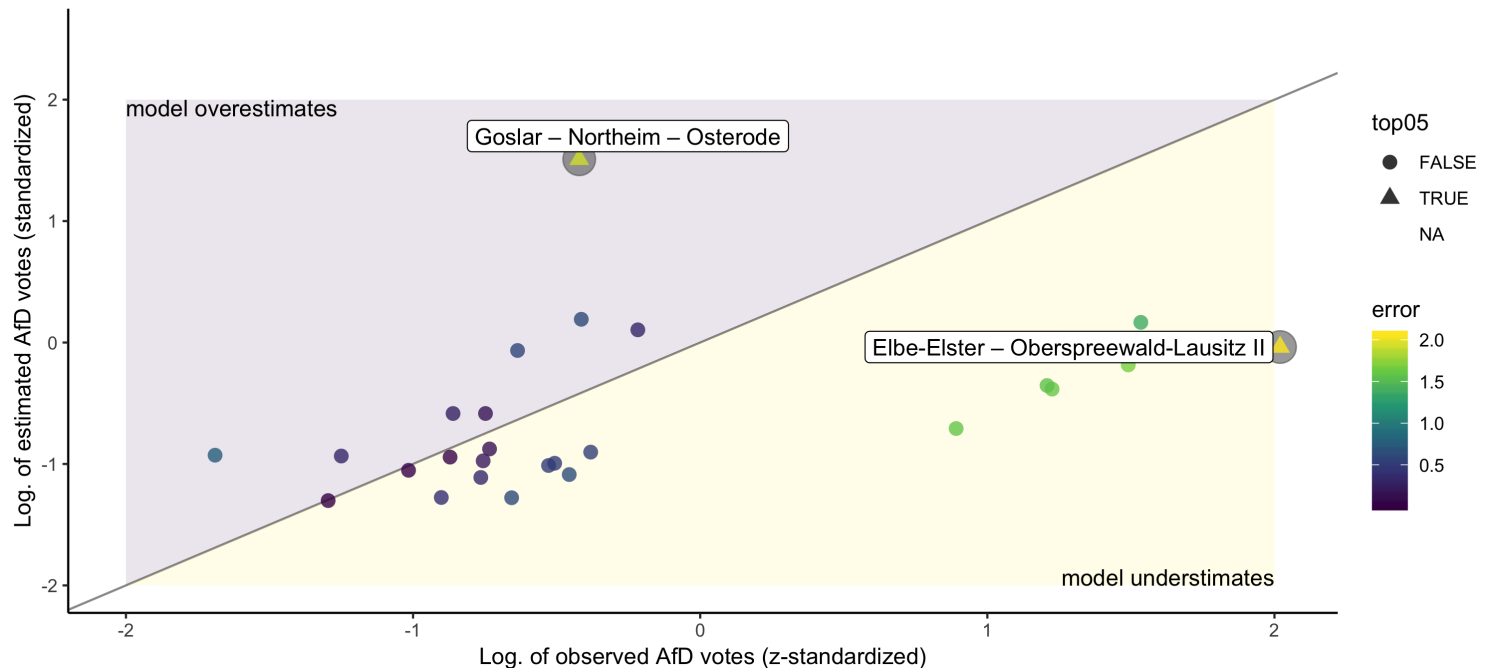Model predictors: state (as multi level) + foreign + unemp
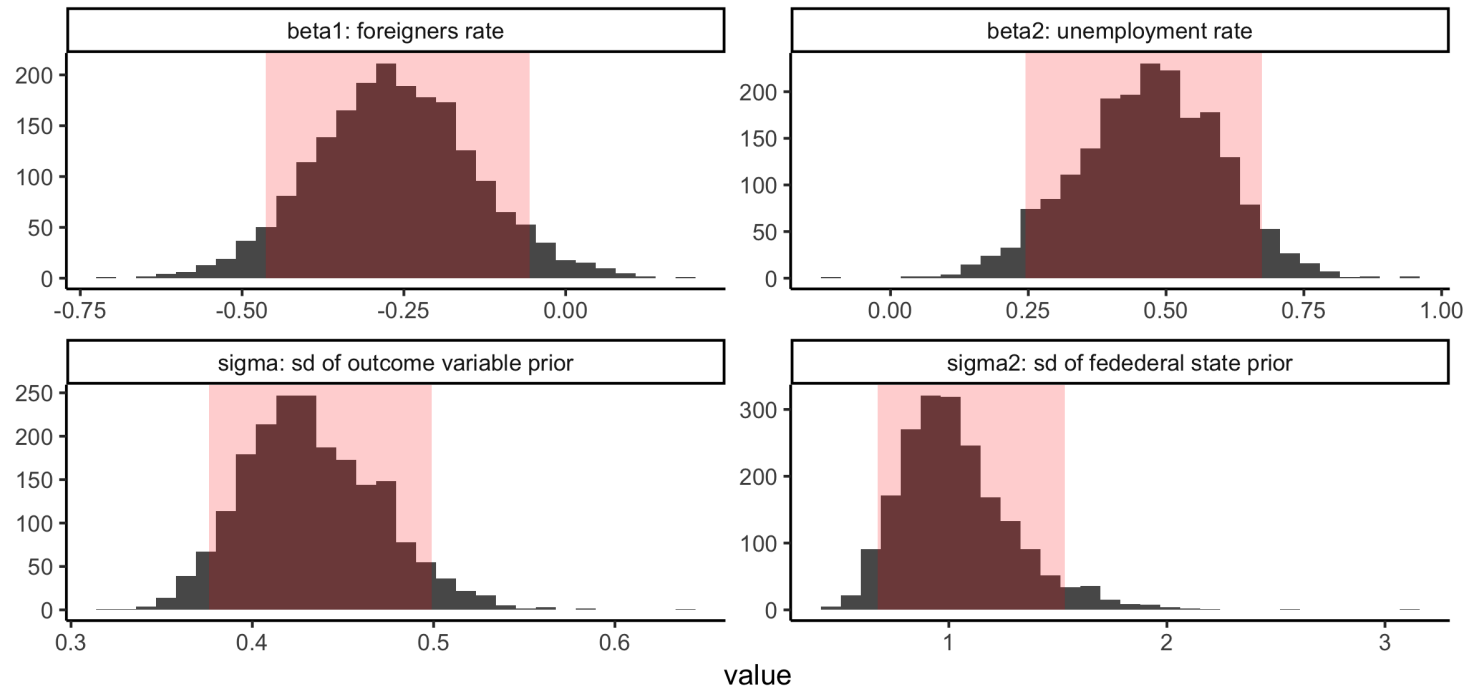
Note. Shaded areas demark 90% mass intervals
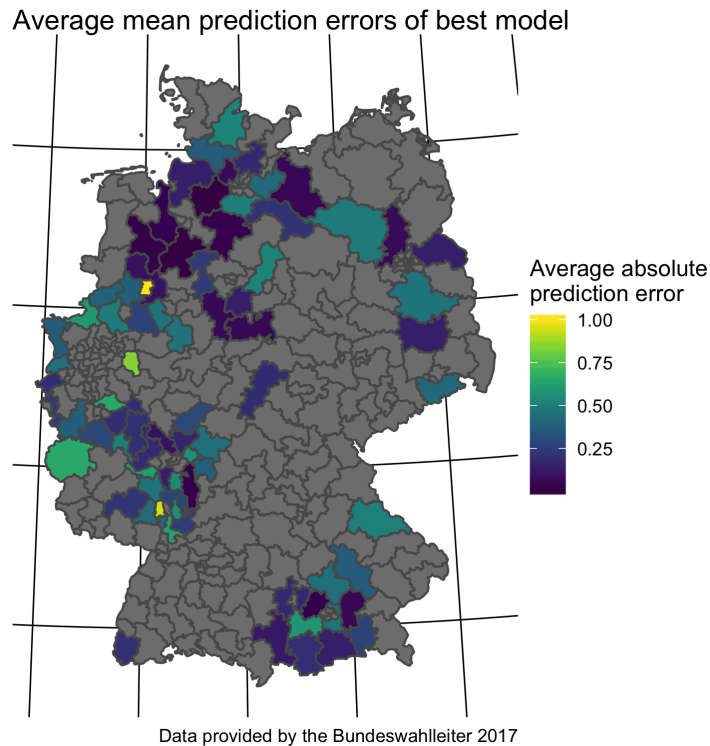
Observed vs. estimated AfD votes

Model predictors: state (as multi level) + foreign + unemp

Modelled vs. observed AFD votes. Top 5 percent predicted errors are labelled

Regional patterns of prediction errors (as to best model)

Average mean prediction errors of best model

Average absolute prediction error

1.00
0.75
0.50
0.25

Data provided by the Bundeswahlleiter 2017

Conclusions

Theoretical implications

- *Region related patterns* appear to play an important role

    - more than unemployment rate and foreigner rate
    - not yet well understood
    - rural? aged society?

- The present model is *simplistic*

- (The proposed) personality pattern didn't show strong impact

- Personality data *representative*?

- Let's model *future elections*

- Pathways of voter behavior remains opaque

Nicole Berbuir, Marcel Lewandowsky & Jasmin Siri (2015) The AfD and its Sympathisers: Finally a Right-Wing Populist Movement in Germany?, German Politics, 24:2, 154-178, DOI: 10.1080/09644008.2014.982546

Statistical implications

- *Observational research* is a very *limited* guide for *causal* interpretations

- *Overfitting* (and underfitting) is to be expected

- *Reduced* sample size of electoral disctricts warrants further investigation

- *Explorative* study, no strong conclusions warranted

- *More models* are possible (but inject researchers' degree of freedom)

Thank you

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 Get slides here: https://github.com/sebastiansauer/afd_values