Predictors of AfD party success in the 2017 elections

A Bayesian modeling approach

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FOM

ECDA 2019

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?

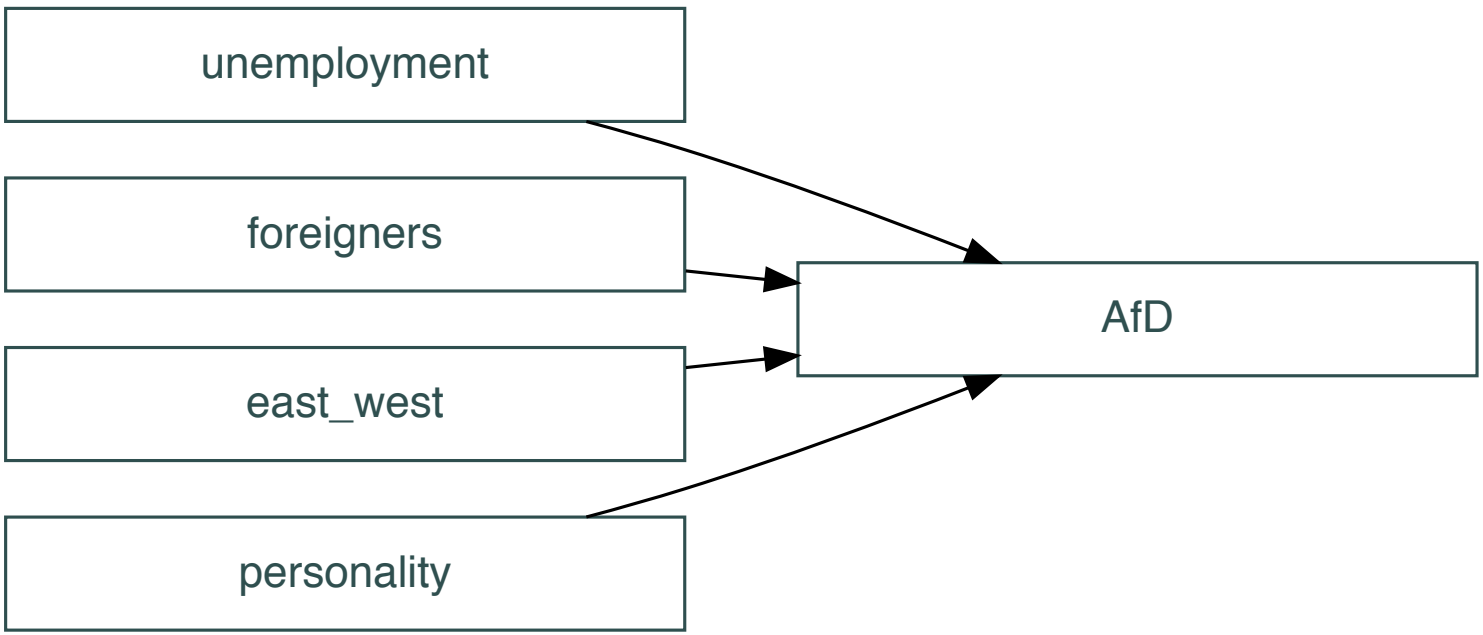
Popular theories on AfD success

Populist party support is fueled by ...

- weak economy ("rust belt hypothesis") 🏭
- high immigration ("flooding hypothesis") 🚶
- cultural patterns ("Saxonia hypothesis") 🚩

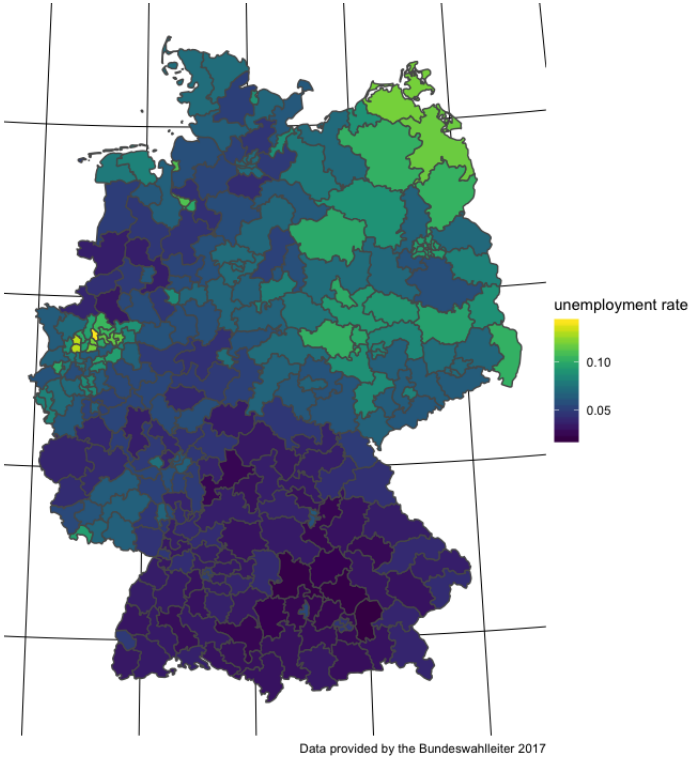
Source: Franz, Christian; Fratzscher, Marcel; Kritikos, Alexander S. (2018) : German right-wing party AfD finds more support in rural areas with aging populations, DIW Weekly Report, ISSN 2568-7697, Deutsches Institut für Wirtschaftsforschung (DIW), Berlin, Vol. 8, Iss. 7/8, pp. 69-79

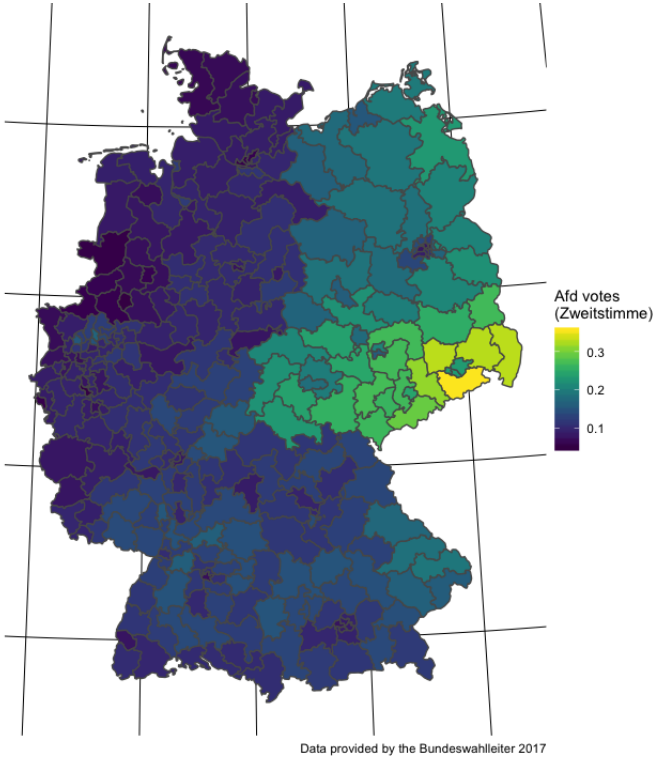
Our research model



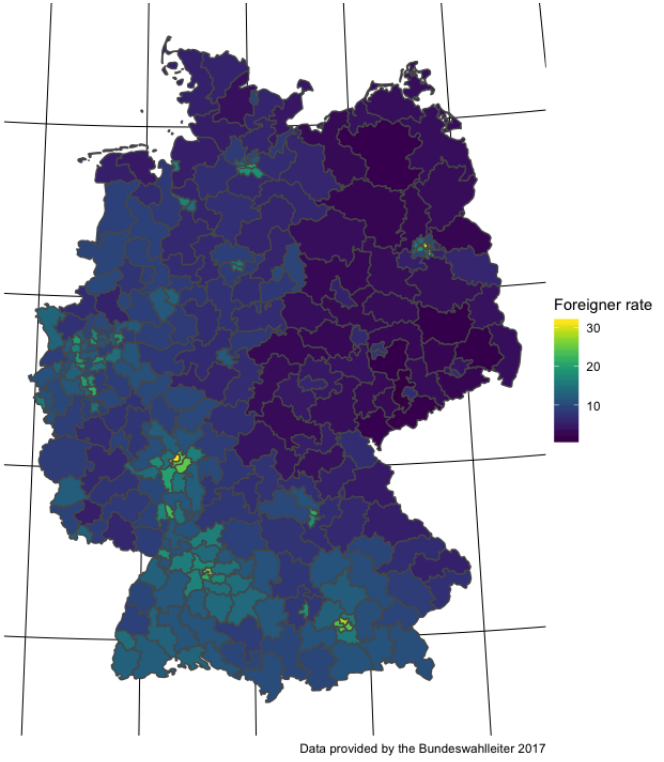
AfD votes, and socioenomic factors at the Bundestagswahl 2017

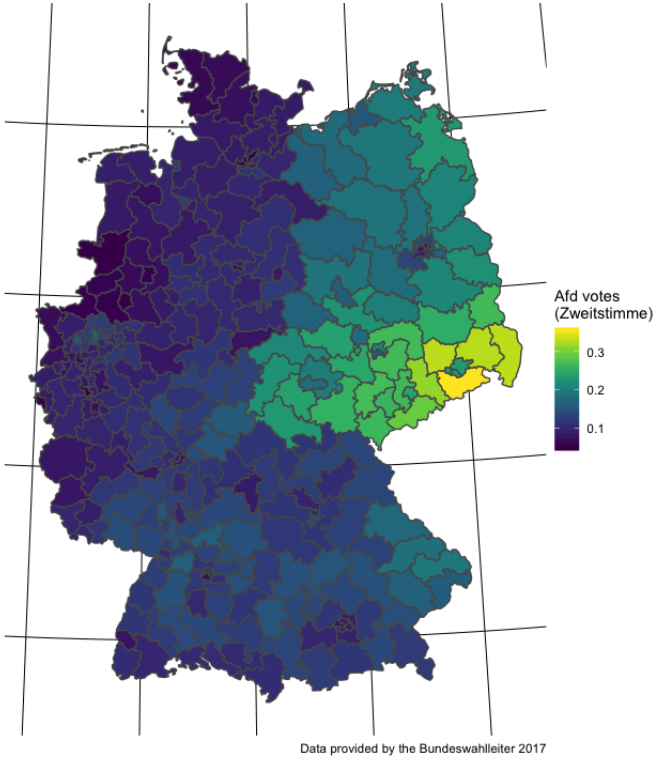
Unemployment and AfD votes





Foreigners and AfD votes

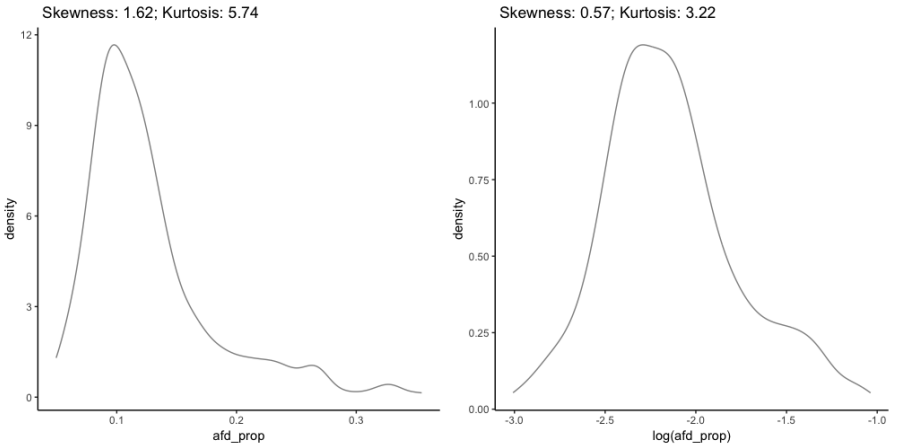




data analysis

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



Personality model CHOUGHS

- Seven personality types according to CHOUGHS model
  - C onformism
  - H endonism
  - O ut of responsibility
  - U nderstand
  - G ourmets
  - H armony
  - S elf-determined
- Sample: approx. 100k face-to-face interviews (stratified by sex and age)
- Multi dimensional scaling was used to devise types
- CHOUGHS builts on Schwartz' values model

Source: Gansser, O., & Lübke, K. (2018). *The development of new typologies of behaviour based on universal human values and purchasing behavior*, in: Archives of Data Science, Series B, in submission. Gebauer, H., Haldimann, M., & Saul, C.J. (2017). Service innovations breaking institutionalized rules of health care. *Journal of Service Management*, 28(5), 972-935.

Bayes modeling

- Stan via the R package `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

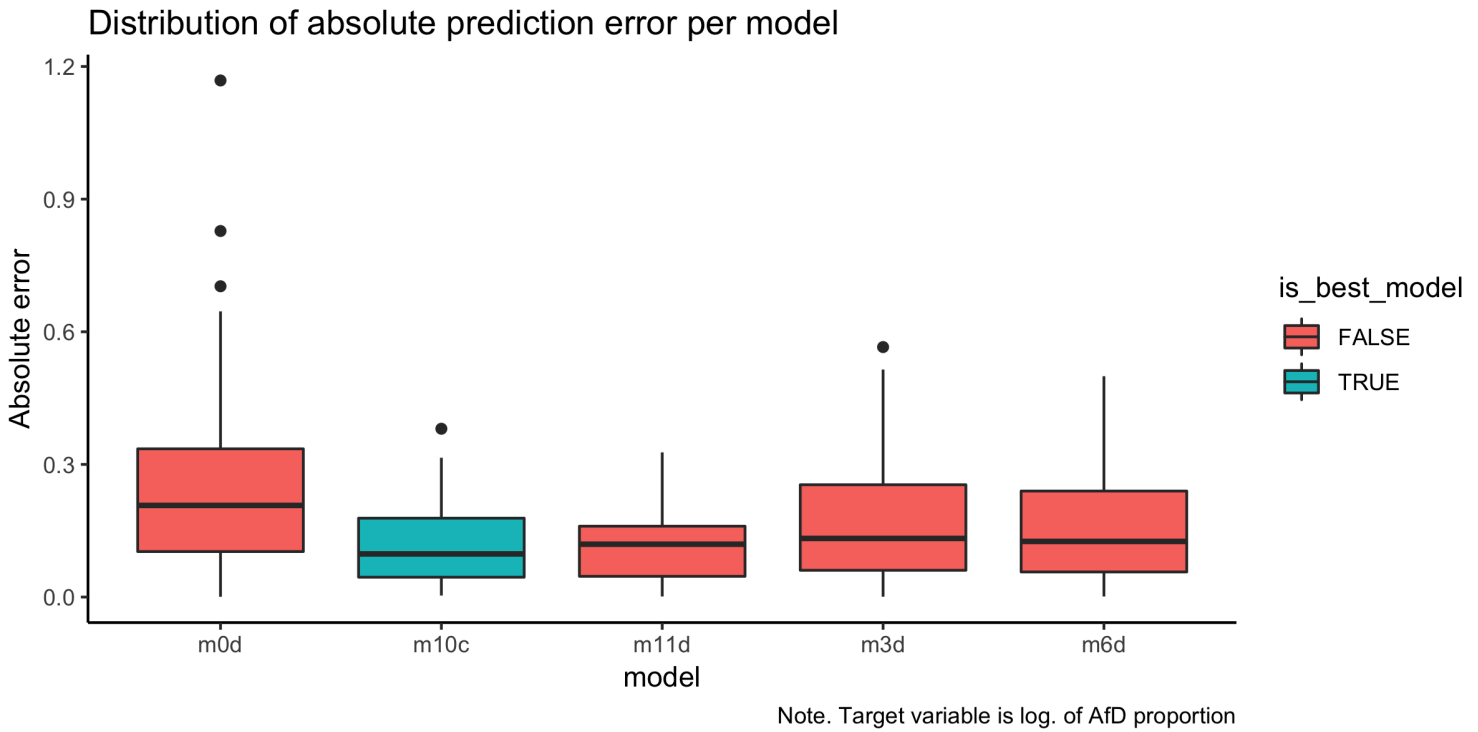
```
# Likelihood:
afd_prop_log ~ dnorm(mu, sigma),

# 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

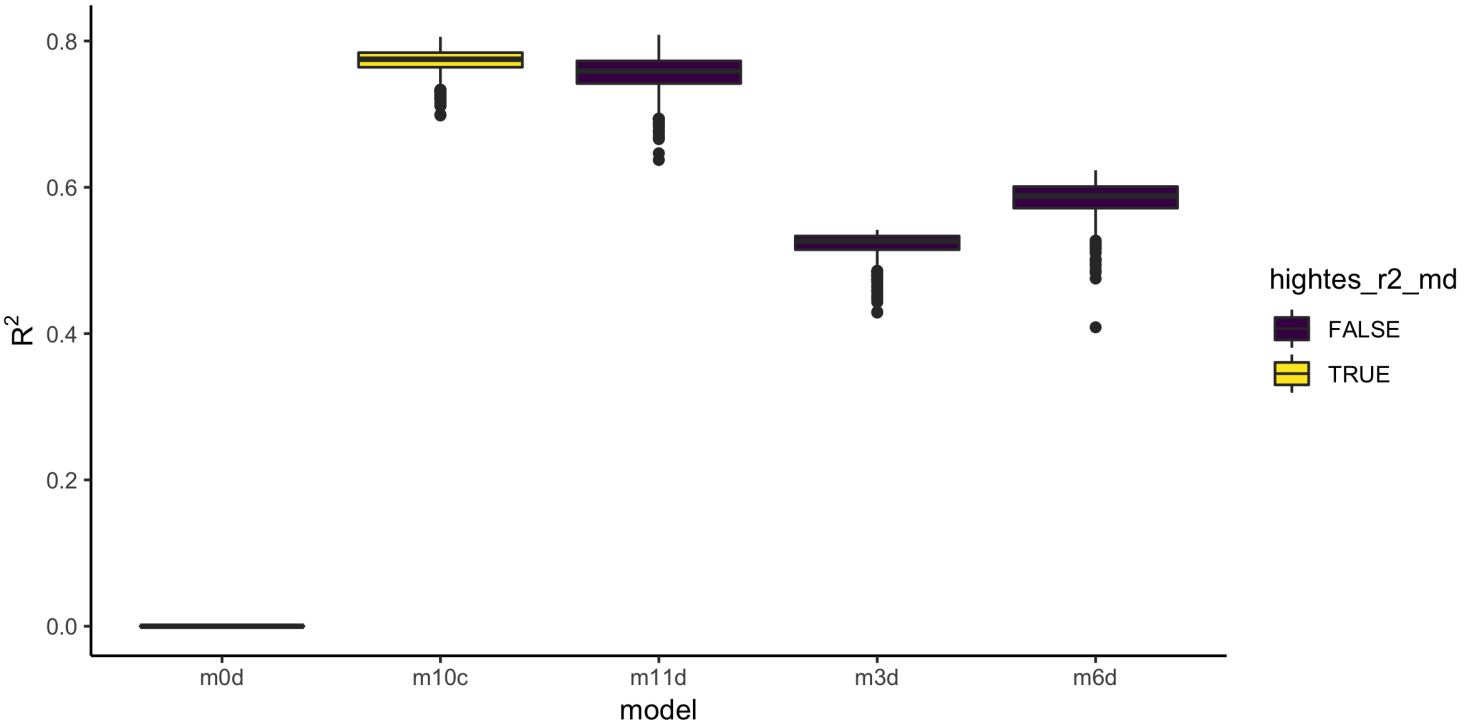
name	predictors	type	WAIC	SE	weight
m10c	**unemp, foreign, state**	**Gaussian**	**-50.97**	**10.74**	**1**
m11d	unemp, foreign, state, 8 consumer types	Gaussian	-39.02	10.31	0
m06d	unemp, foreign, east, 8 consumer types	Gaussian	-6.96	12.50	0
m03d	unemp, foreign, east	Gaussian	-1.24	12.44	0
m00d	none	Gaussian	54.39	16.13	0
m12d	unemp, foreign, state, 8 consumer types	Poisson	64311.15	10241.34	0
m09b	unemp, foreign, state	Poisson	64453.60	9016.30	0
m00e	none	Poisson	211670.94	51582.24	0

Comparing model errors



R squared estimates for each model

Beware: Unadjusted R^2 estimates, prone to overfitting



Results: Most favorable model

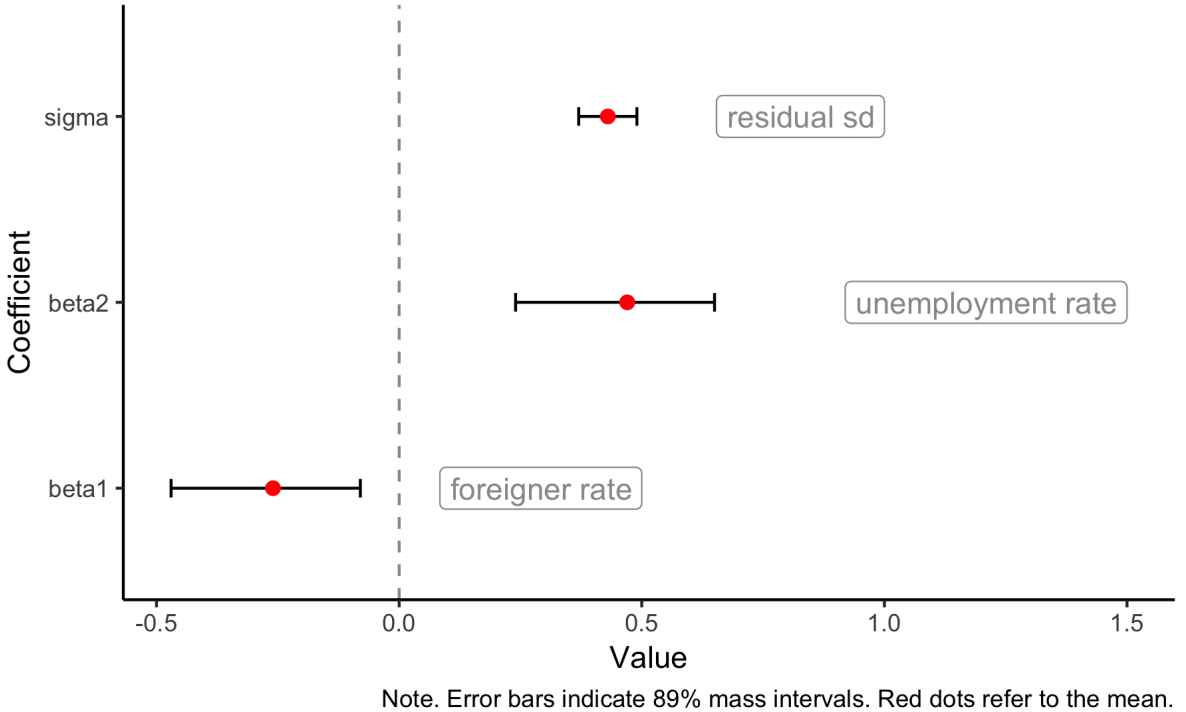
Model specification of most favorable model

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

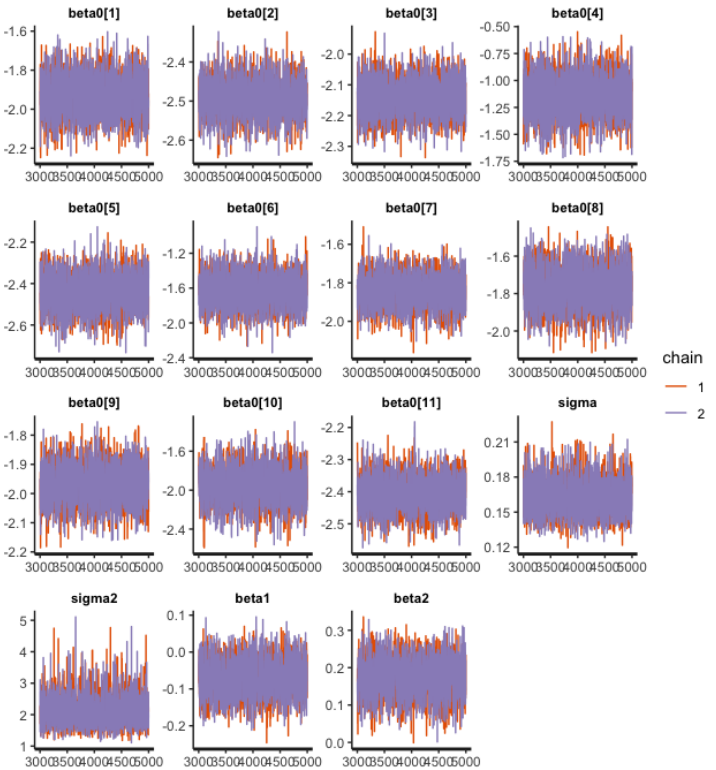
Model predictors: state (as multi level) + foreign + unemp



Only level 1 coefficients are shown.

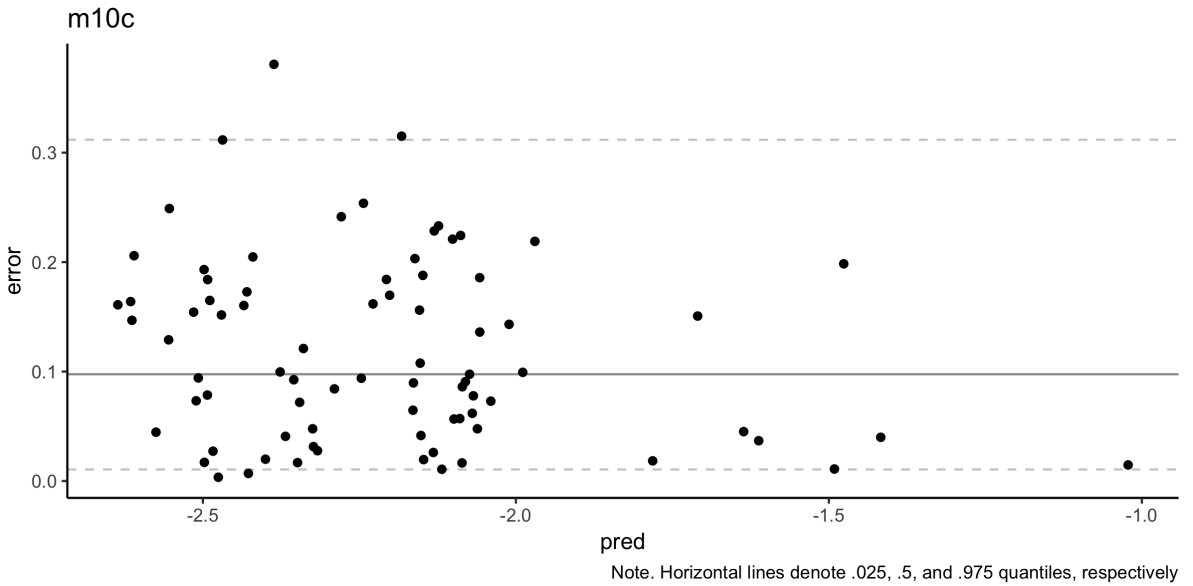
Big fat hairy catterpillars, as it should be

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



Model additivity assumption of best model

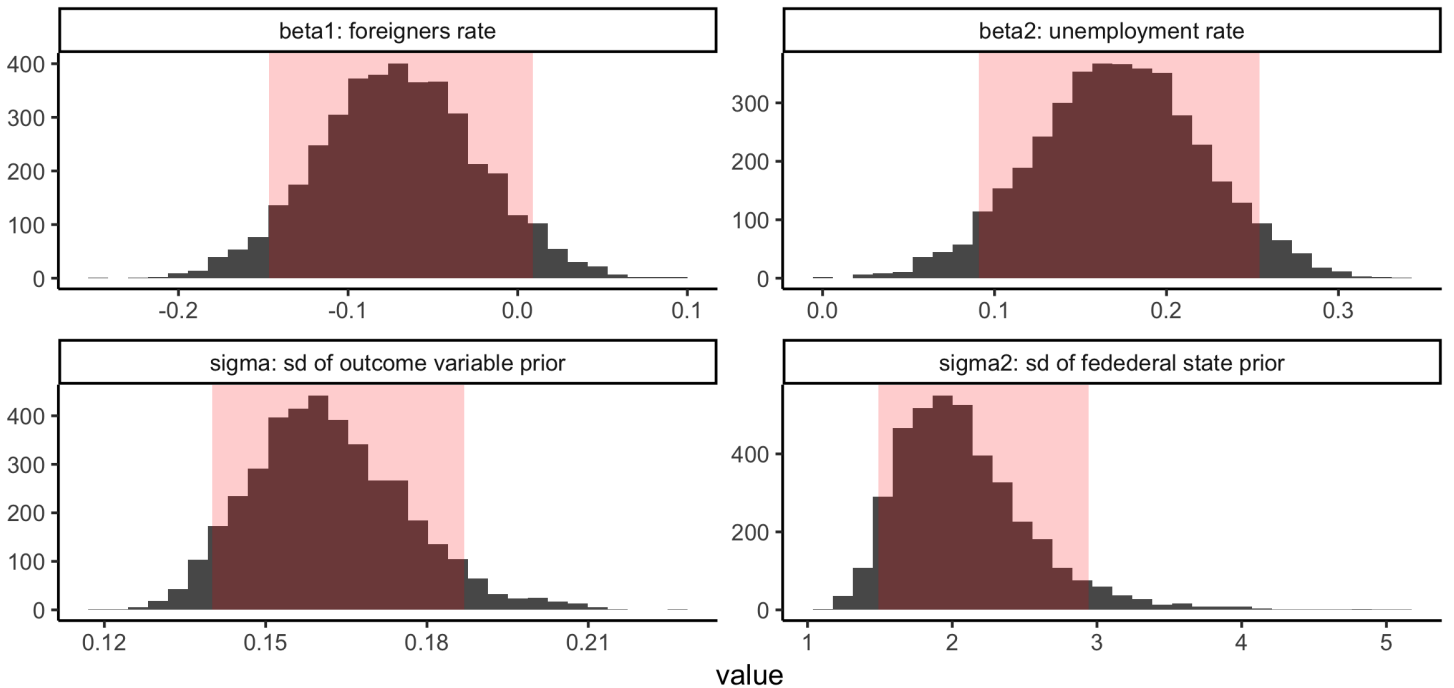
Model predictors: state (as multi level) + foreign + unemp



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

Posterior distributions of best model

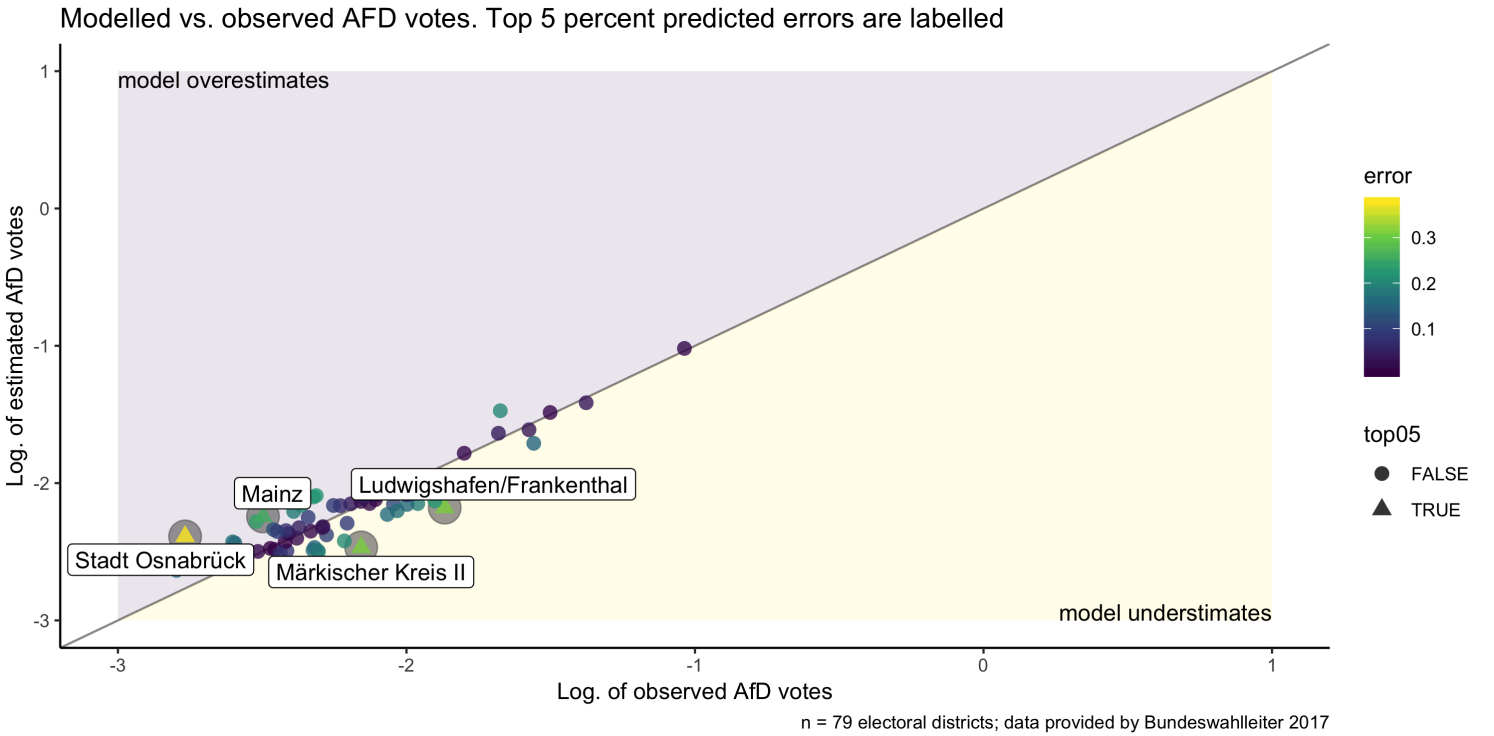
Model predictors: state (as multi level) + foreign + unemp



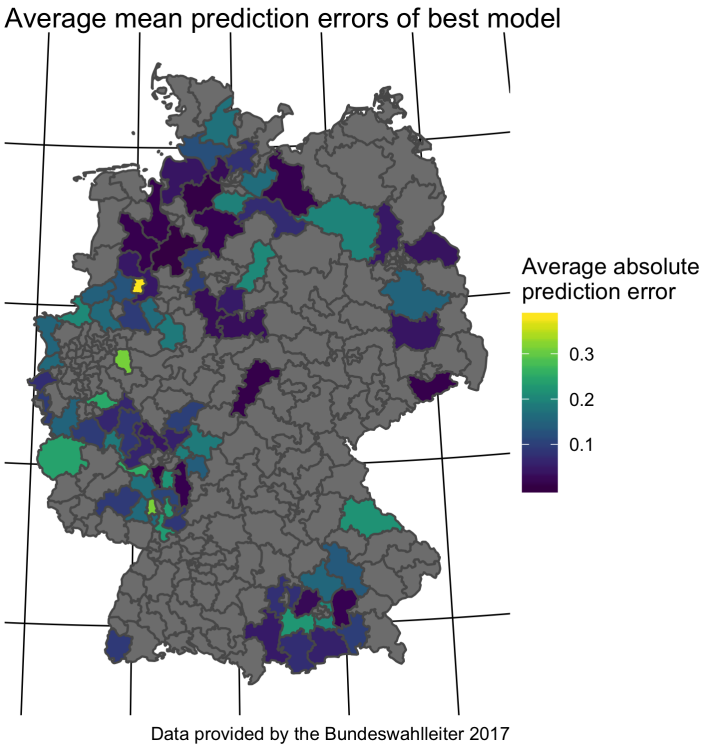
Note. Shaded areas demark 90% mass intervals

Observed vs. estimated AfD votes

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



Regional patterns of prediction errors (as to best model)



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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