What Citizens Want from the Economy

Determinants and Predictability of Economic Evaluations

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Goal: Uncover which economic outcomes citizens value

- What drives beliefs about state of the economy? Many (too many?) possibilities?
  - GDP growth
  - How easy/hard it is to find a job? How many jobs are created?
- General problem/blessing: large number of covariates
- **Claim:** approaches from machine learning can reliably identify the attributes of the economy that drive subjective economic sentiment

Summary

- RQ: When is the economy doing “well enough” according to citizens?
  - When the labor market indicators are favorable
  - Methodological contribution: characterize uncertainly around split points
- RQ2: How serious are partisan biases of US respondents’ economic evaluations?

Two related tasks

- **Forecast:** How many people do we expect to be satisfied with state of the economy in country X, given certain macroeconomic conditions?

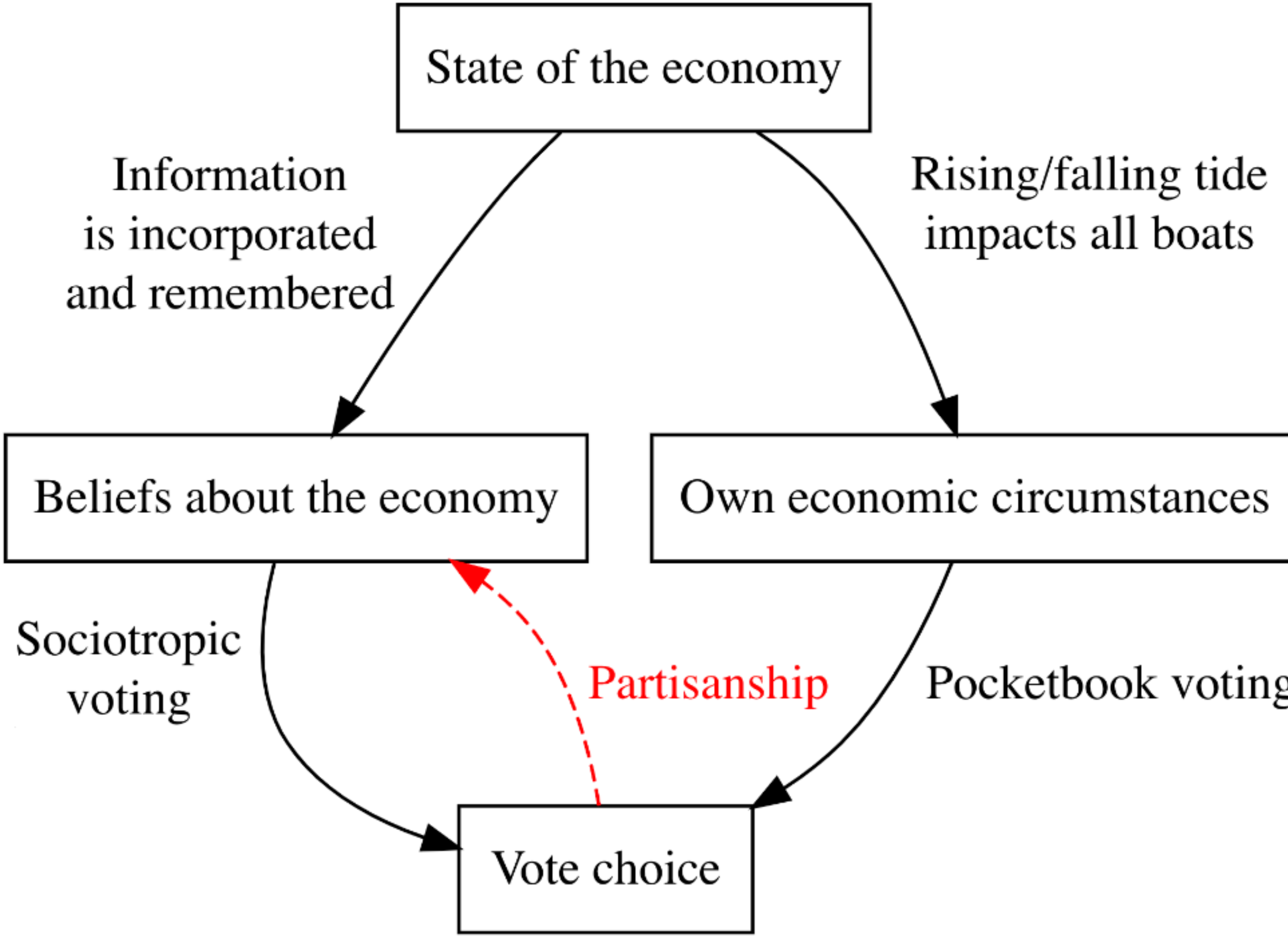
- **Parameter estimation:** Under what conditions are most people likely to be unhappy about the state of the economy?

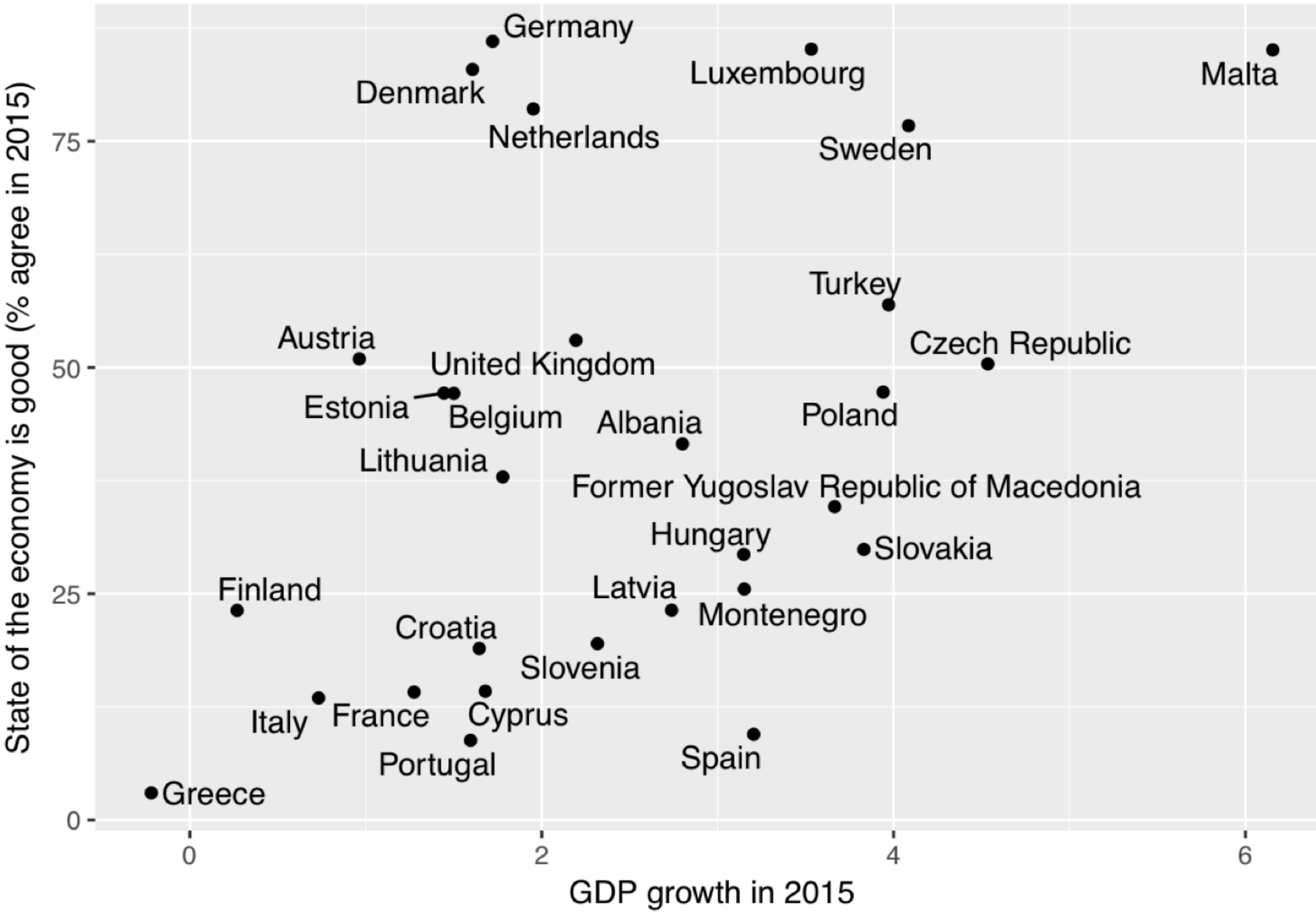
Data & Methods

- Eurobarometer/Gallup/Pew data. How would you judge current economic conditions?
- **Outcome:** Proportion of respondents evaluating the economy positively
- Common approach: add “plausible” covariates into a long regression
- Alternative: disciplined variable selection
  - Allows for search over a rich set of variables and functional forms
  - Let data decide how to make the bias-variance trade-off *Kleinberg et al. (2015)*

Plausible feature space

- GDP growth (annual %)
- GDP per capita, PPP (current international $)
- Inflation
- Unemployment rate
- Personal remittances, received (% of GDP)
- Government expenditures (% of GDP)
- General government final consumption expenditure (% of GDP)
- Exports of goods and services (% of GDP)
- Gross fixed capital formation (annual % growth)
- Trade (% of GDP)
- Agriculture, forestry, and fishing, value added (% of GDP)
- Manufacturing, value added (% of GDP)
- Industry (including construction), value added (% of GDP)
- Industry (including construction), value added (annual % growth)
- **And 70+ other variables**


State of the economy
Information
is incorporated
and remembered
Rising/falling tide
impacts all boats
Beliefs about the economy
Own economic circumstances
Sociotropic
voting
Partisanship
Pocketbook voting
Vote choice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Estonia
Belgium
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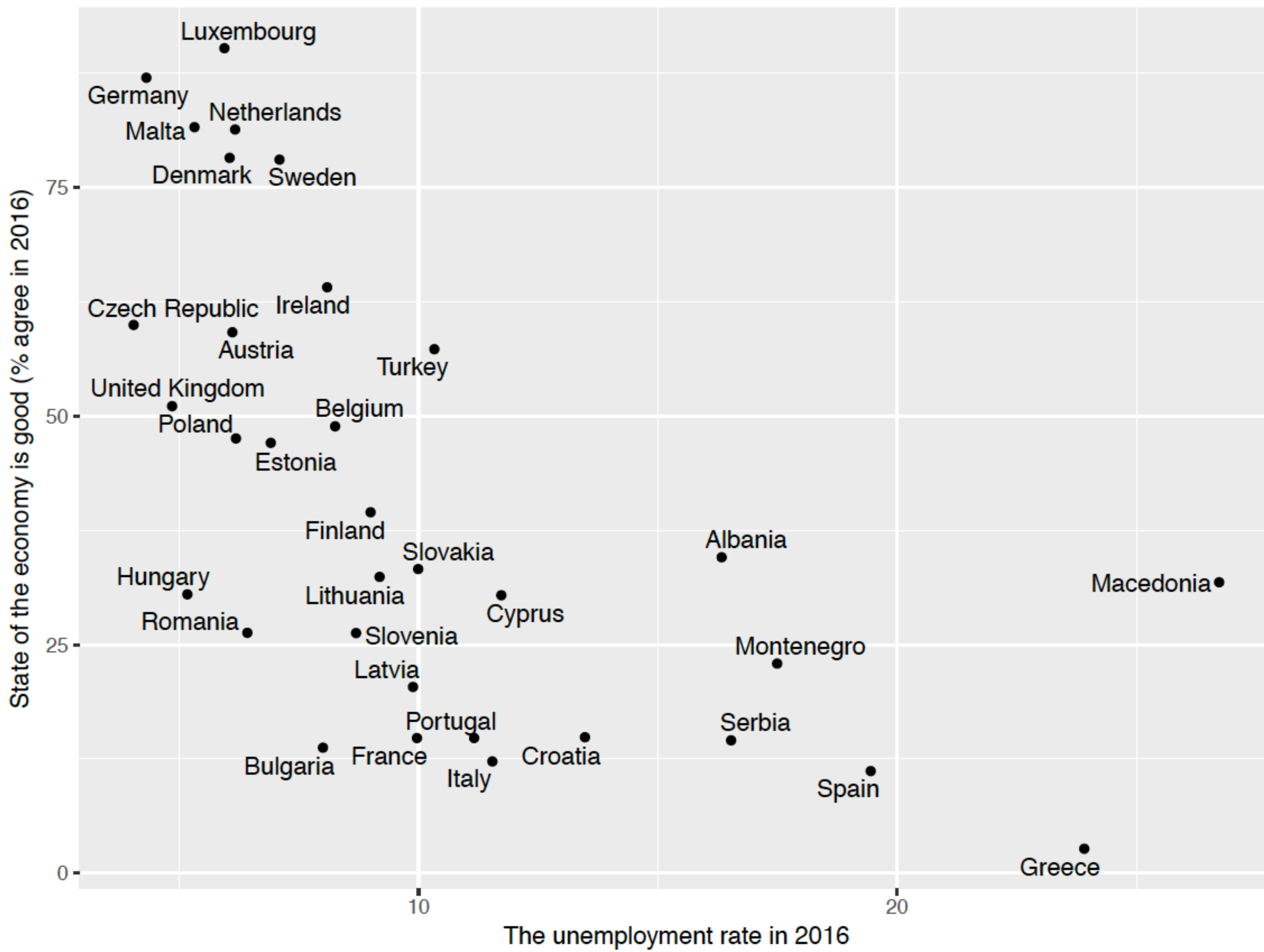
Lithuania
Former Yugoslav Republic of Macedonia
Hungary
Slovakia
Finland
Latvia
Montenegro
Croatia
Slovenia
Italy
France
Cyprus
Portugal
Spain
Greece
75
50
25
0
2
4
6
State of the economy is good (% agree in 2015)
GDP growth in 2015



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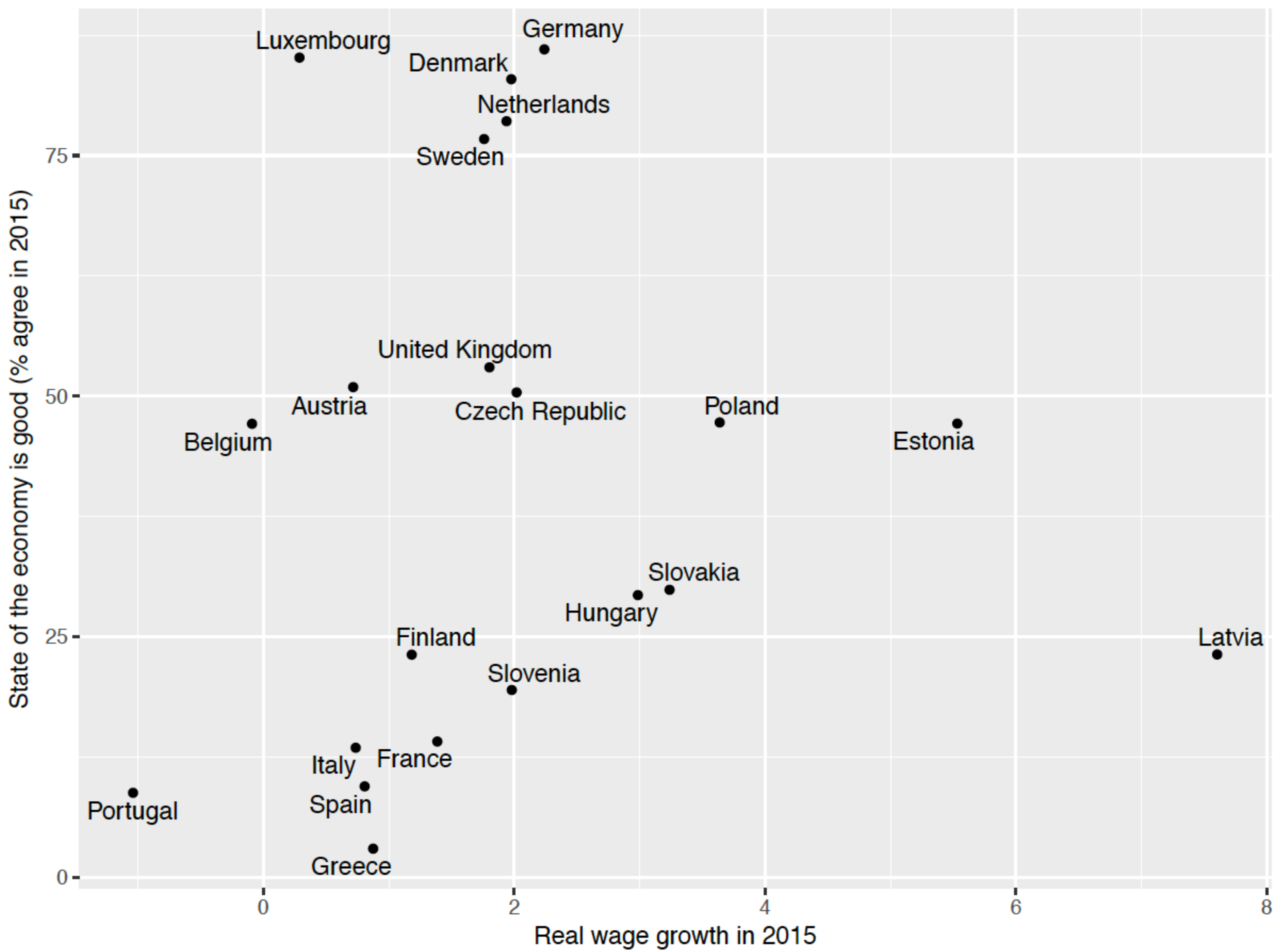
Slovakia
Macedonia
Hungary
Lithuania
Cyprus
Romania
Slovenia
Montenegro
Latvia
Portugal
Serbia
France
Croatia
Bulgaria
Italy
Spain
Greece
75
50
25
0
10
20
State of the economy is good (% agree in 2016)
The unemployment rate in 2016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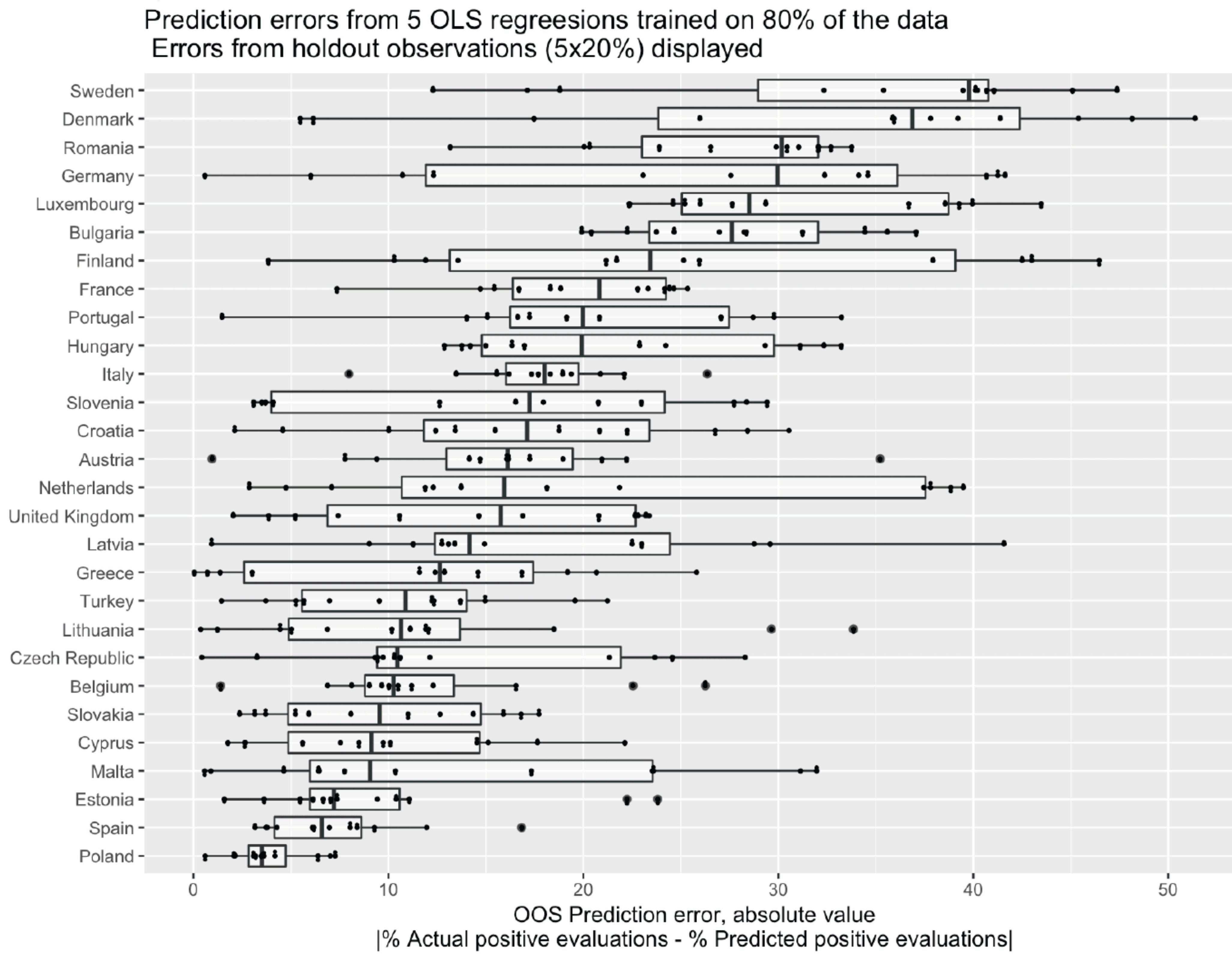
Latvia
Slovenia
Italy
France
Portugal
Spain
Greece
State of the economy is good (% agree in 2015)
Real wage growth in 2015
0
25
50
75
0
2
4
6
8

Figure 2. Out-of-sample residuals. Data: Economic sentiment in the EU & neighboring countries, 2005-2016.



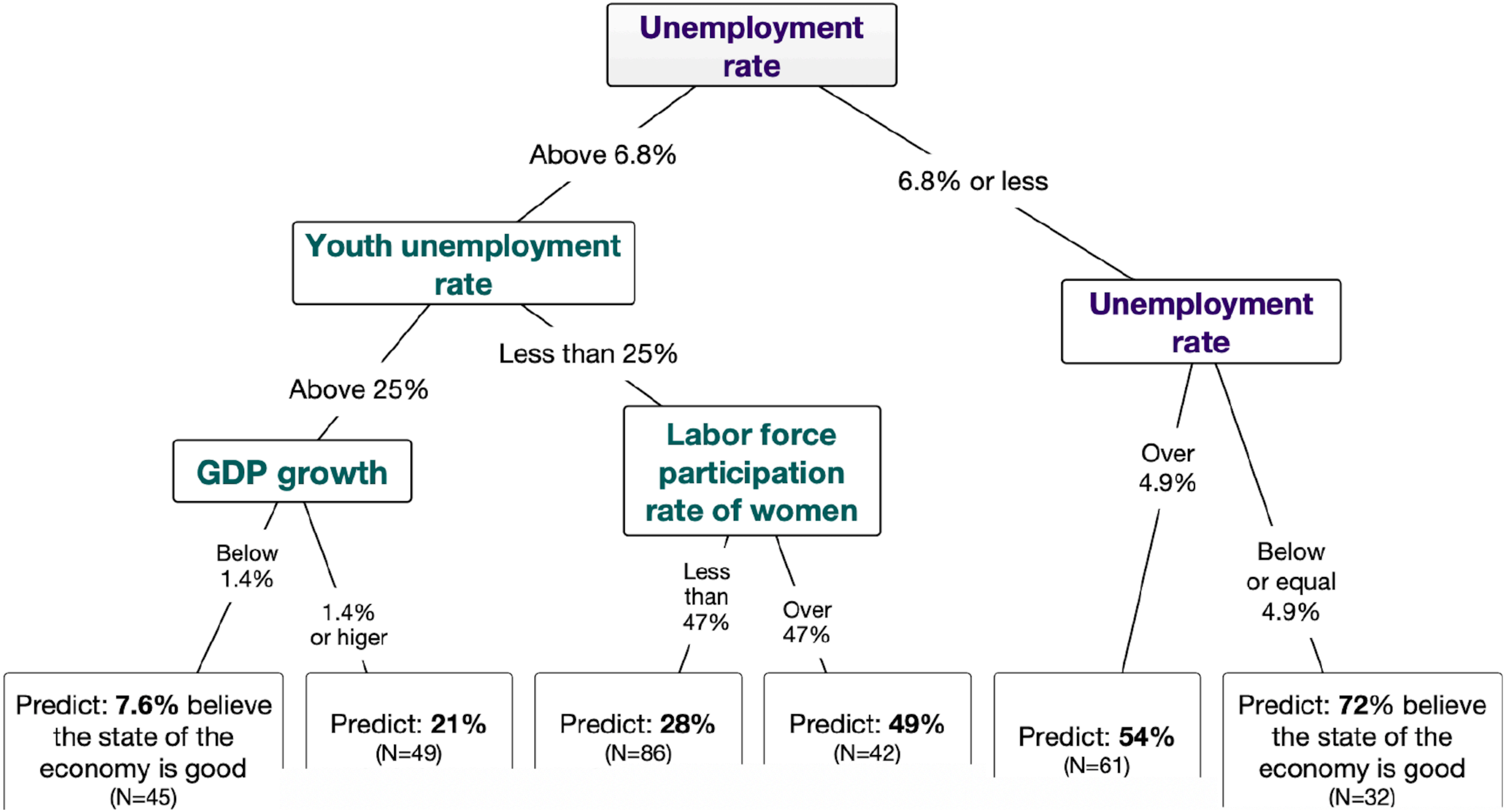
Search for best predictors

Regression trees

- Sequentially partition the covariate space
- Pick an optimal split of the data to minimize deviance (squared residuals)
- Check all variables but only pick the most diagnostic one at each step
- Typically keep going until a large tree is built, then prune

Random forest

- Randomize which variables are available for splitting at each step
- Grow 1000 trees. Let each tree make a prediction.


Unemployment rate
Above 6.8%
6.8% or less
Youth unemployment rate
Above 25%
Less than 25%
Unemployment rate
GDP growth
Labor force participation rate of women
Over 4.9%
Below or equal 4.9%
Below 1.4%
1.4% or higer
Less than 47%
Over 47%
Predict: 7.6% believe the state of the economy is good (N=45)
Predict: 21% (N=49)
Predict: 28% (N=86)
Predict: 49% (N=42)
Predict: 54% (N=61)
Predict: 72% believe the state of the economy is good (N=32)

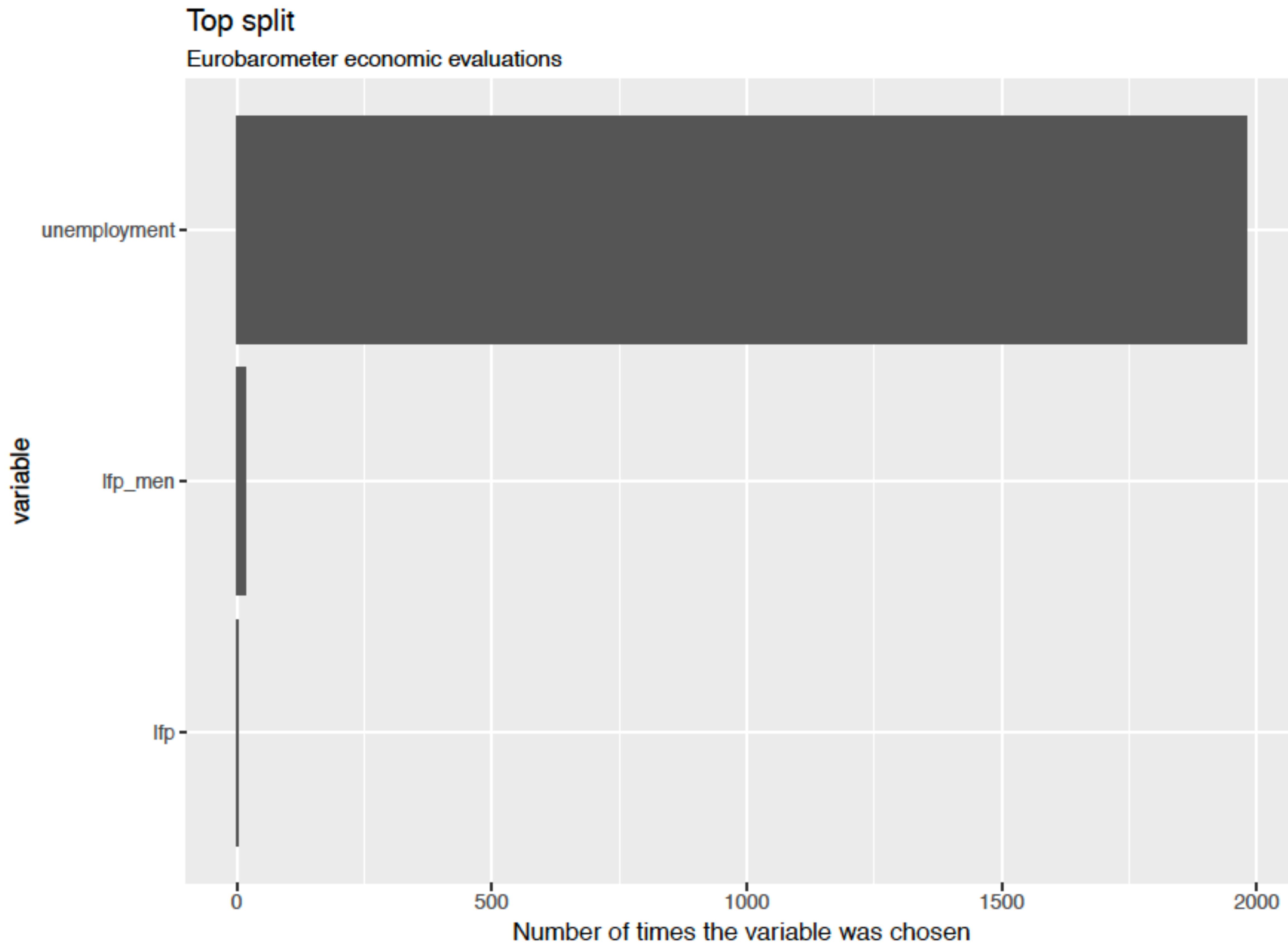
Questions

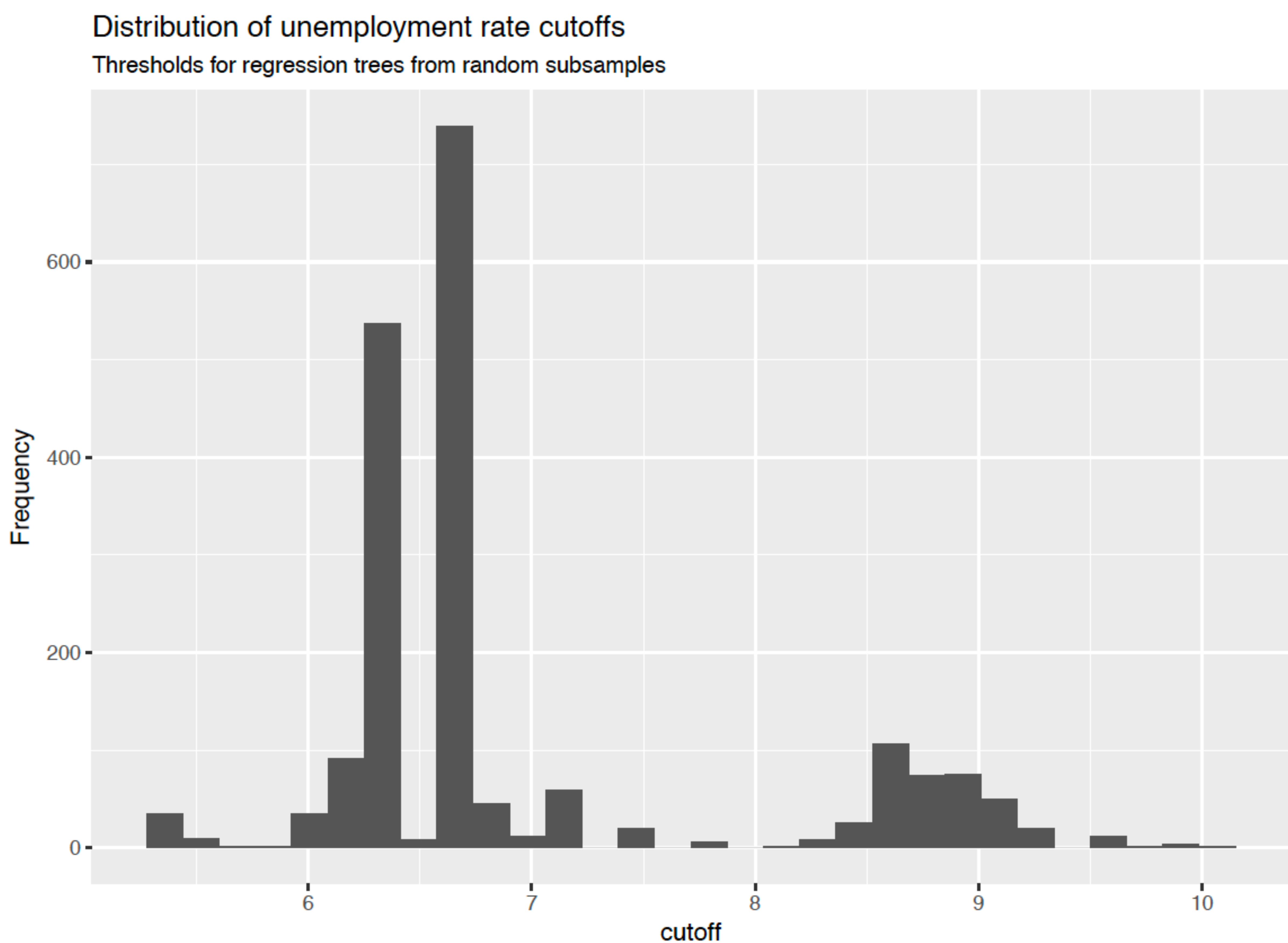
- How much should we trust the splitting procedure to reveal the most important variable?

- How fragile is the threshold value?

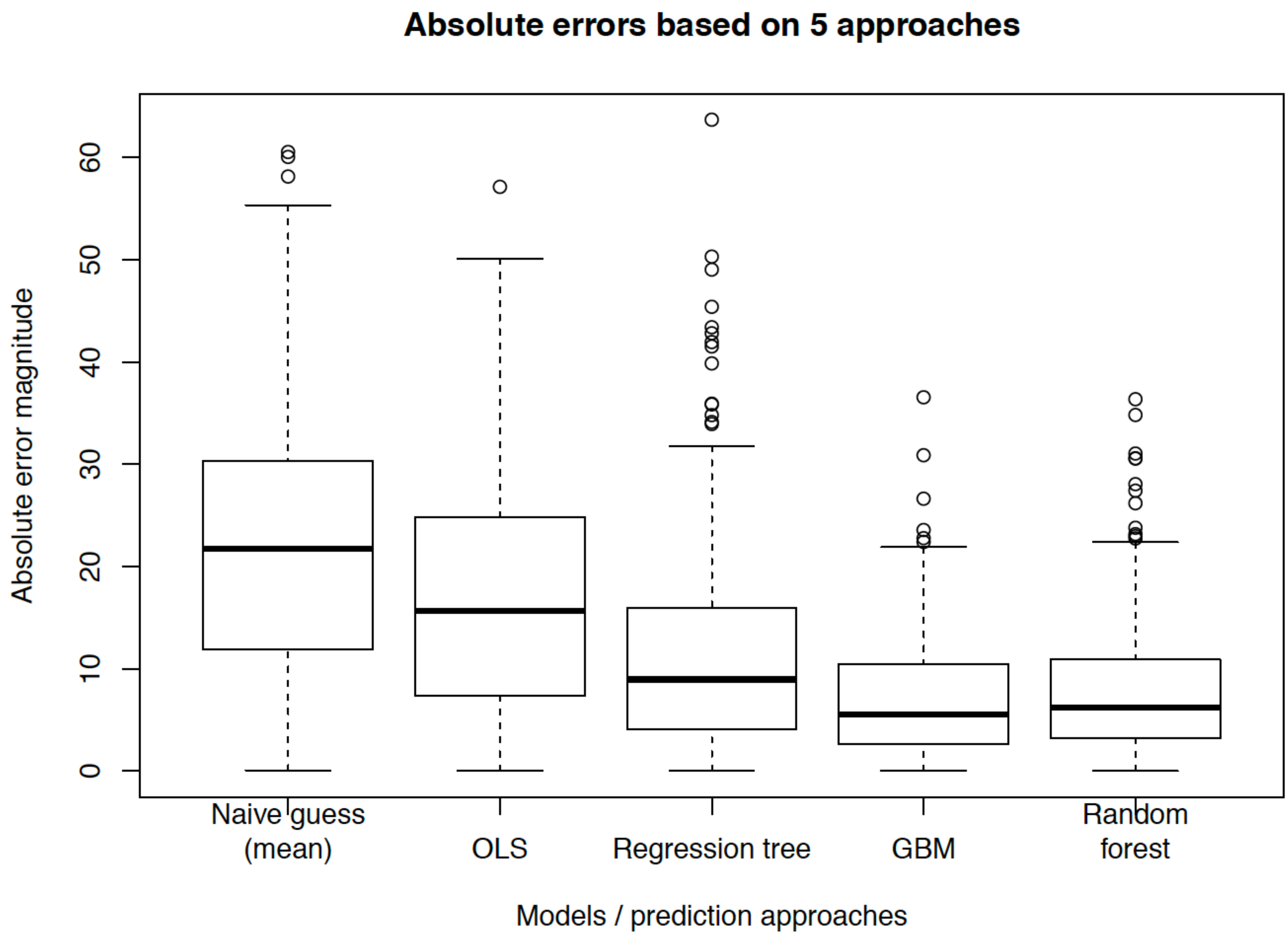
- Are simple prediction rules better at predicting economic sentiment than linear models?

Distribution of top splits

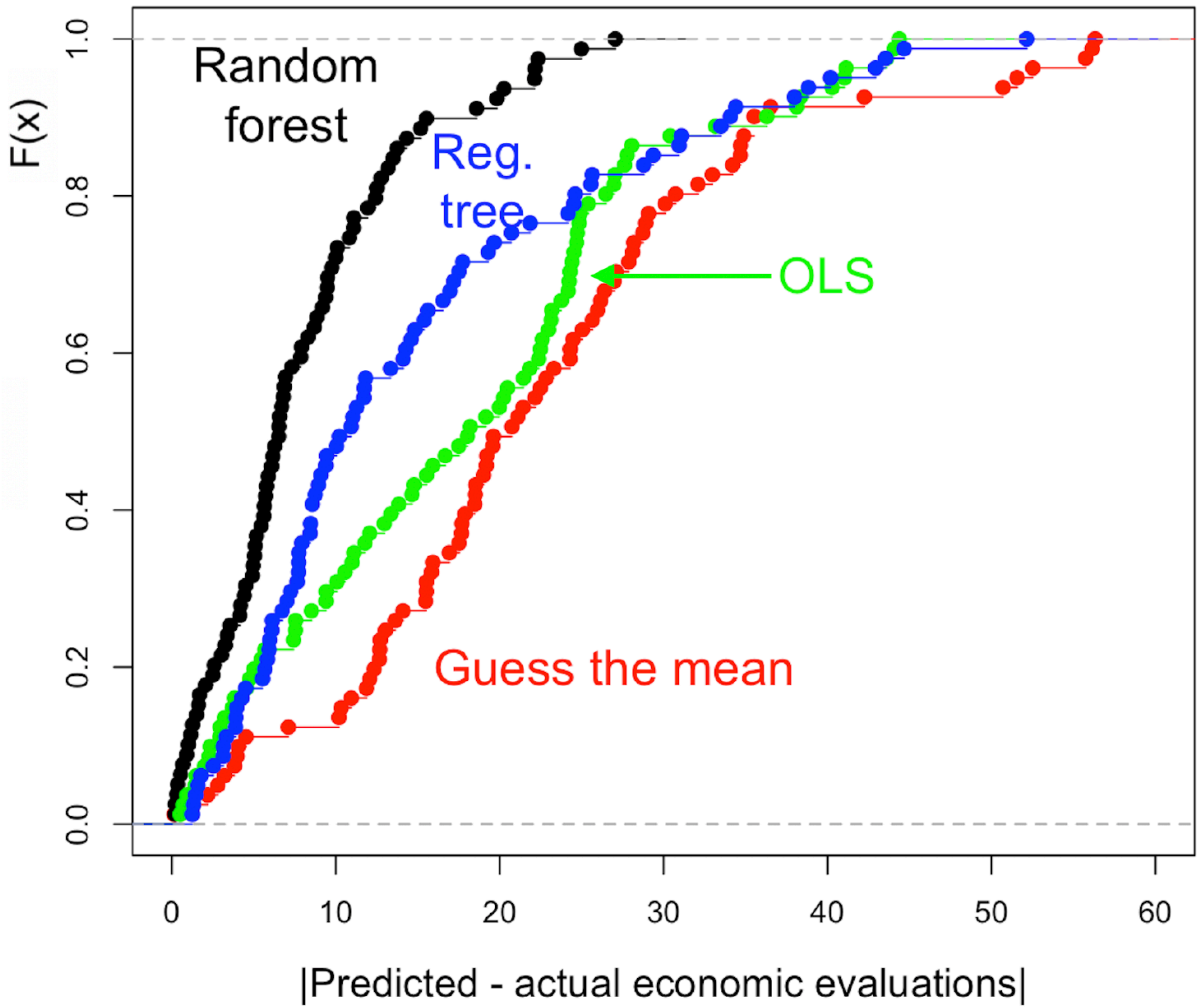


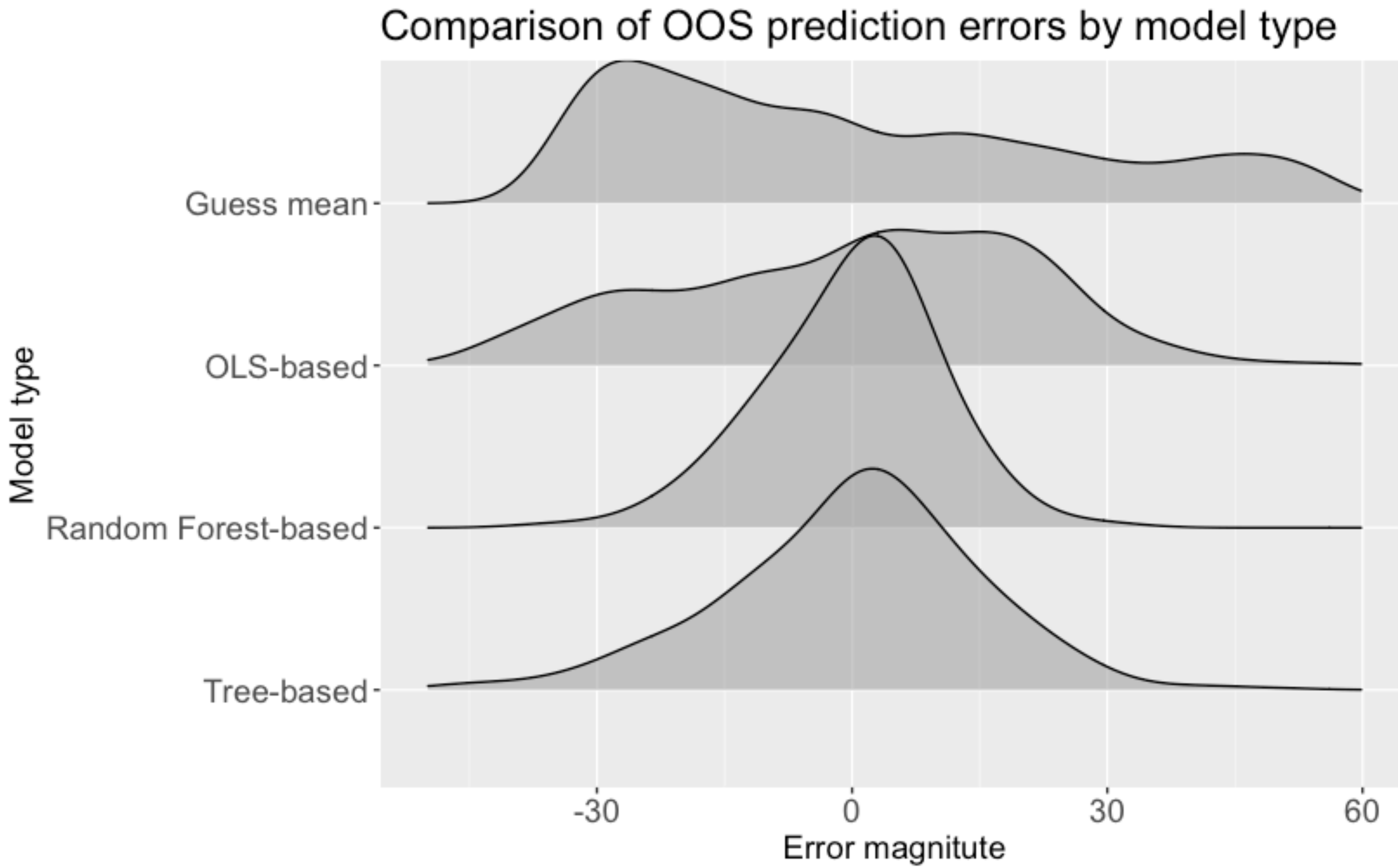

Distribution of unemployment rate cutoffs
Thresholds for regression trees from random subsamples
Frequency
600
400
200
0
6
7
8
9
10
cutoff

Out-of-sample performance of four modeling approaches relative to guessing the global mean (as a benchmark)



Cumulative distributions of OOS absolute prediction errors obtained via RF, RT, OLS and guessing the mean




Comparison of OOS prediction errors by model type
Model type
Guess mean
OLS-based
Random Forest-based
Tree-based
-30
0
30
60
Error magnitute

Midpoint

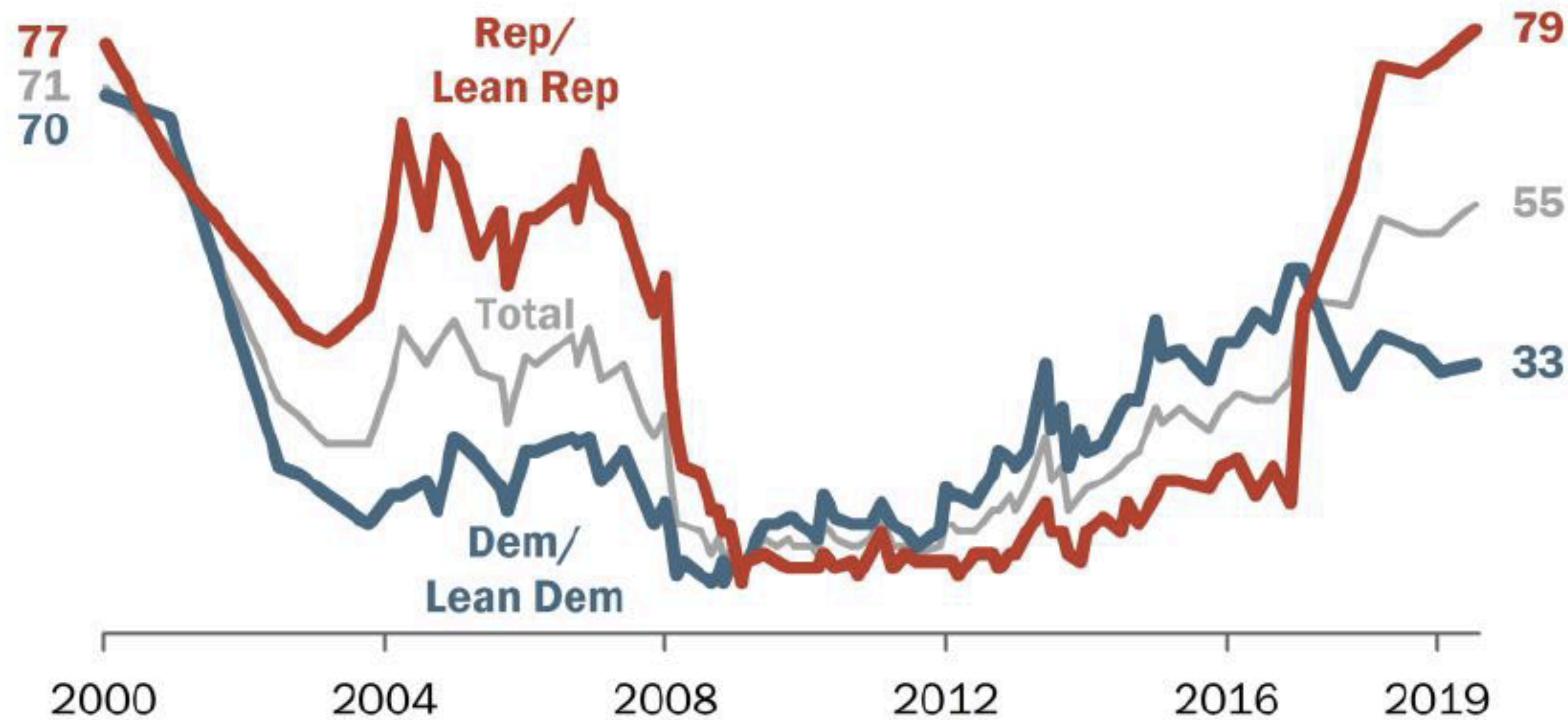
- Uncovered informative indicators with cross-national data
- Non-linear models perform better
- **Next:** Evidence from the U.S.

Measurement challenge: misreporting and inattention

- Evidence of partisan biases: Main and Sufi (2017)
- Possibility: Economic evaluations are really measuring political opinions
- H: Only some citizens (non-partisans) are actually evaluating the economy
- H: Only in some (non-polarized) countries can we gather meaningful data on economic sentiment

Since Trump took office, positive economic views have surged among Republicans, sagged among Democrats

% who rate national economic conditions as excellent or good



Source: Survey of U.S. adults conducted July 10-15, 2019.

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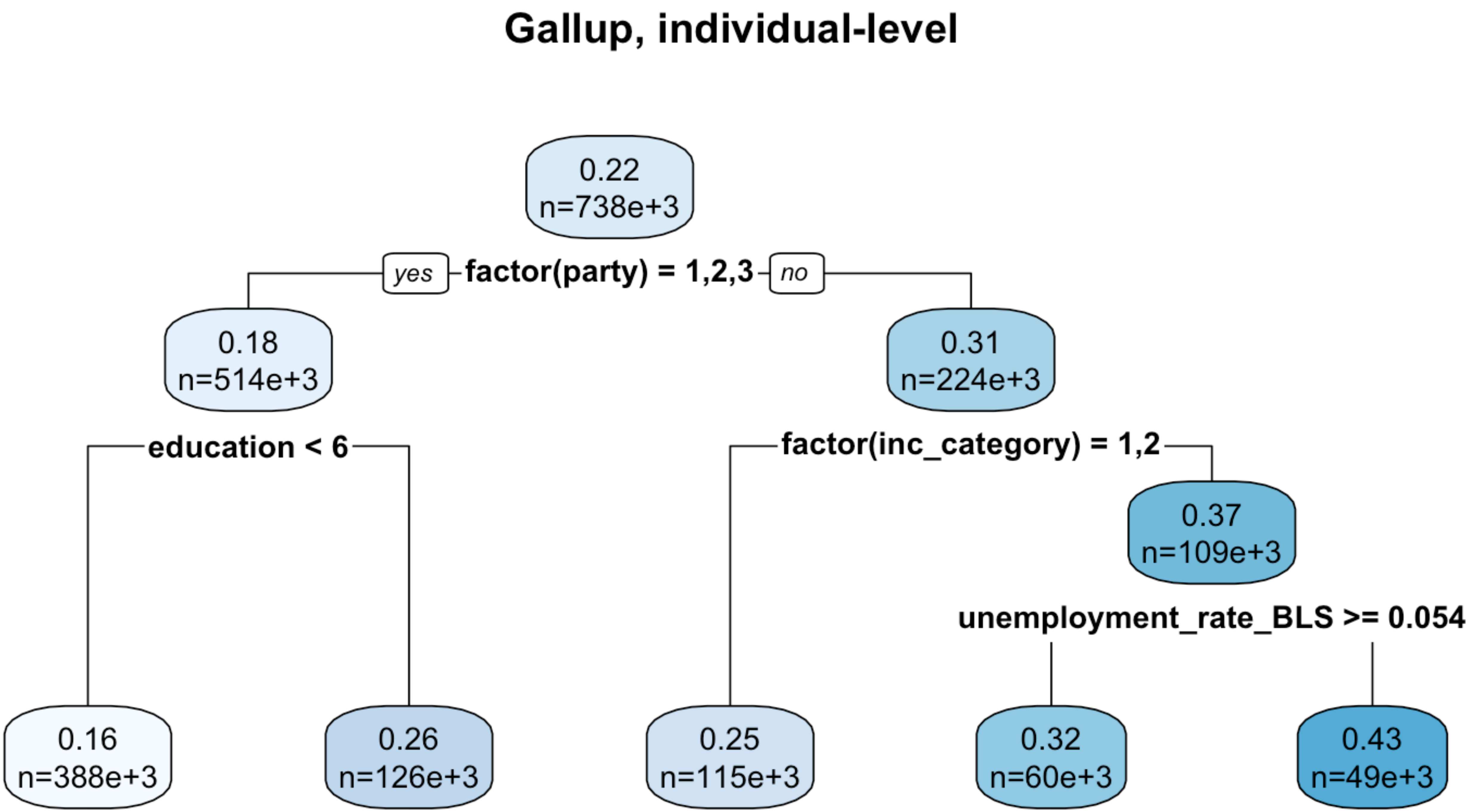
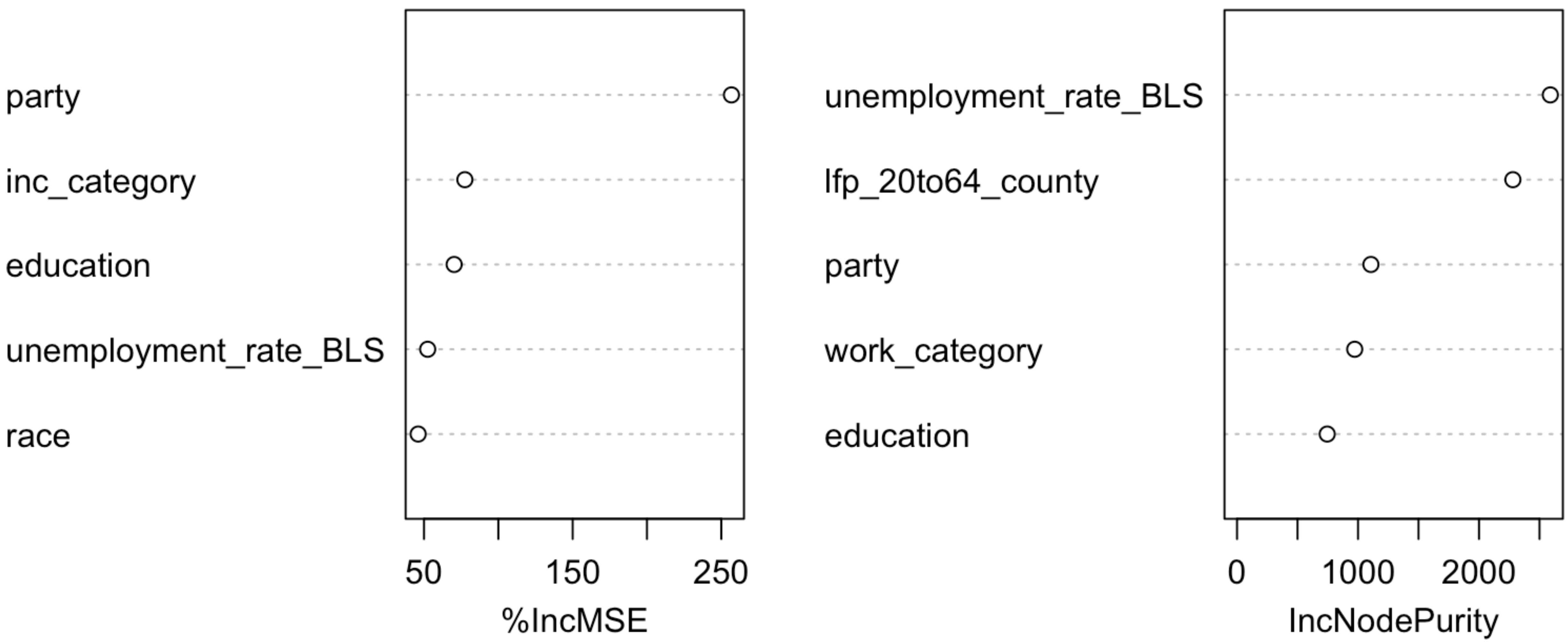
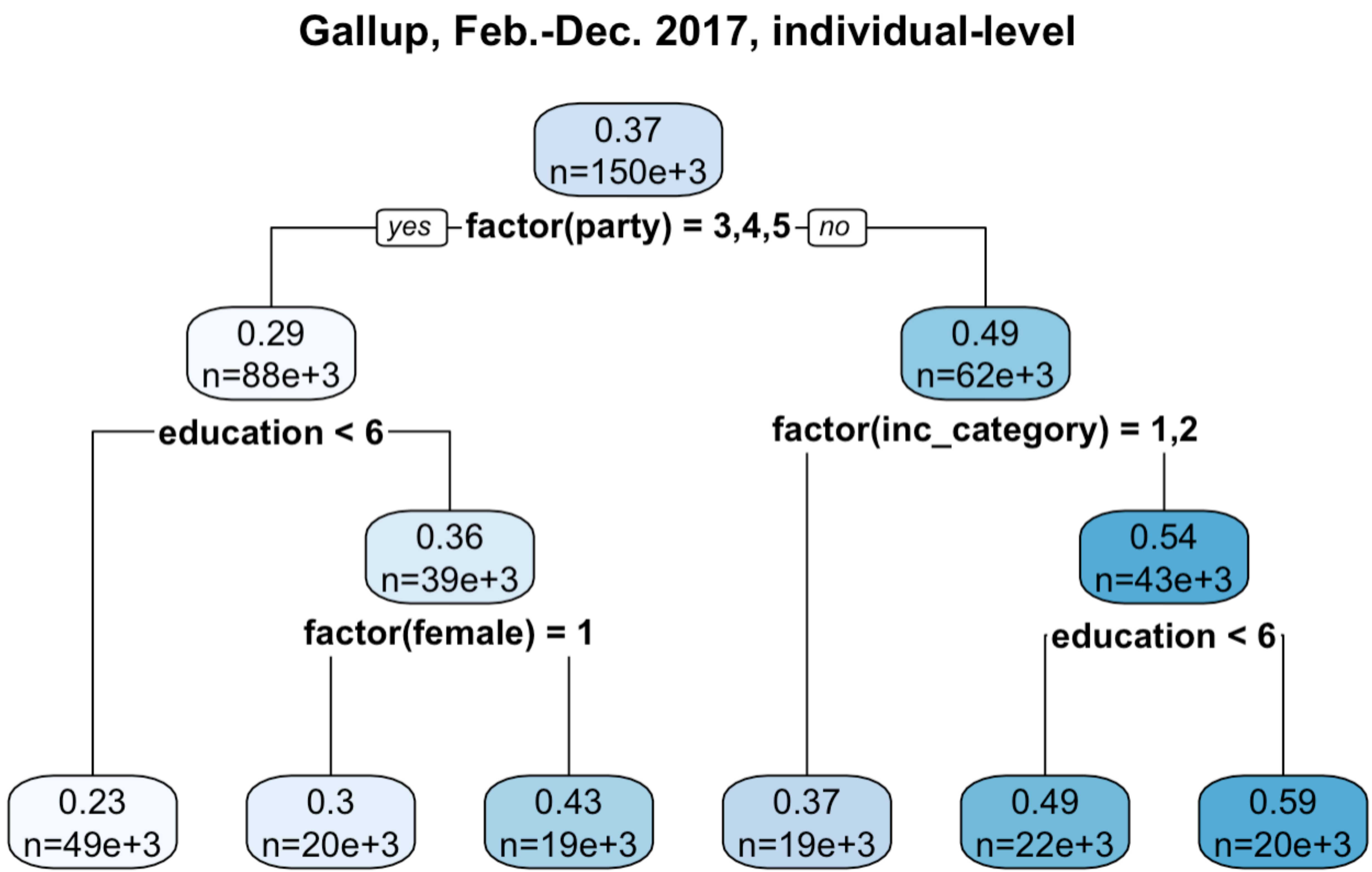
Individual-level analyses

- Data: Gallup US daily polls. Feb. 2013 – Oct. 2016. N=733,343 (488,932 in the full model)
- Respondents' gender, income, race, age, education, religion, union status, marital status, type of work, party ID, ZIP/MPSA/county identifiers
- Merged in: unemployment rate (county), state–level GDP growth and LFP


Gallup, individual-level
0.22
n=738e+3
yes
factor(party) = 1,2,3
no
0.18
n=514e+3
0.31
n=224e+3
education < 6
factor(inc_category) = 1,2
0.37
n=109e+3
unemployment_rate_BLS >= 0.054
0.16
n=388e+3
0.26
n=126e+3
0.25
n=115e+3
0.32
n=60e+3
0.43
n=49e+3

Variable importance





Gallup, Feb.-Dec. 2017, individual-level
0.37
n=150e+3
yes
factor(party) = 3,4,5
no
0.29
n=88e+3
0.49
n=62e+3
education < 6
factor(inc_category) = 1,2
0.36
n=39e+3
0.54
n=43e+3
factor(female) = 1
education < 6
0.23
n=49e+3
0.3
n=20e+3
0.43
n=19e+3
0.37
n=19e+3
0.49
n=22e+3
0.59
n=20e+3

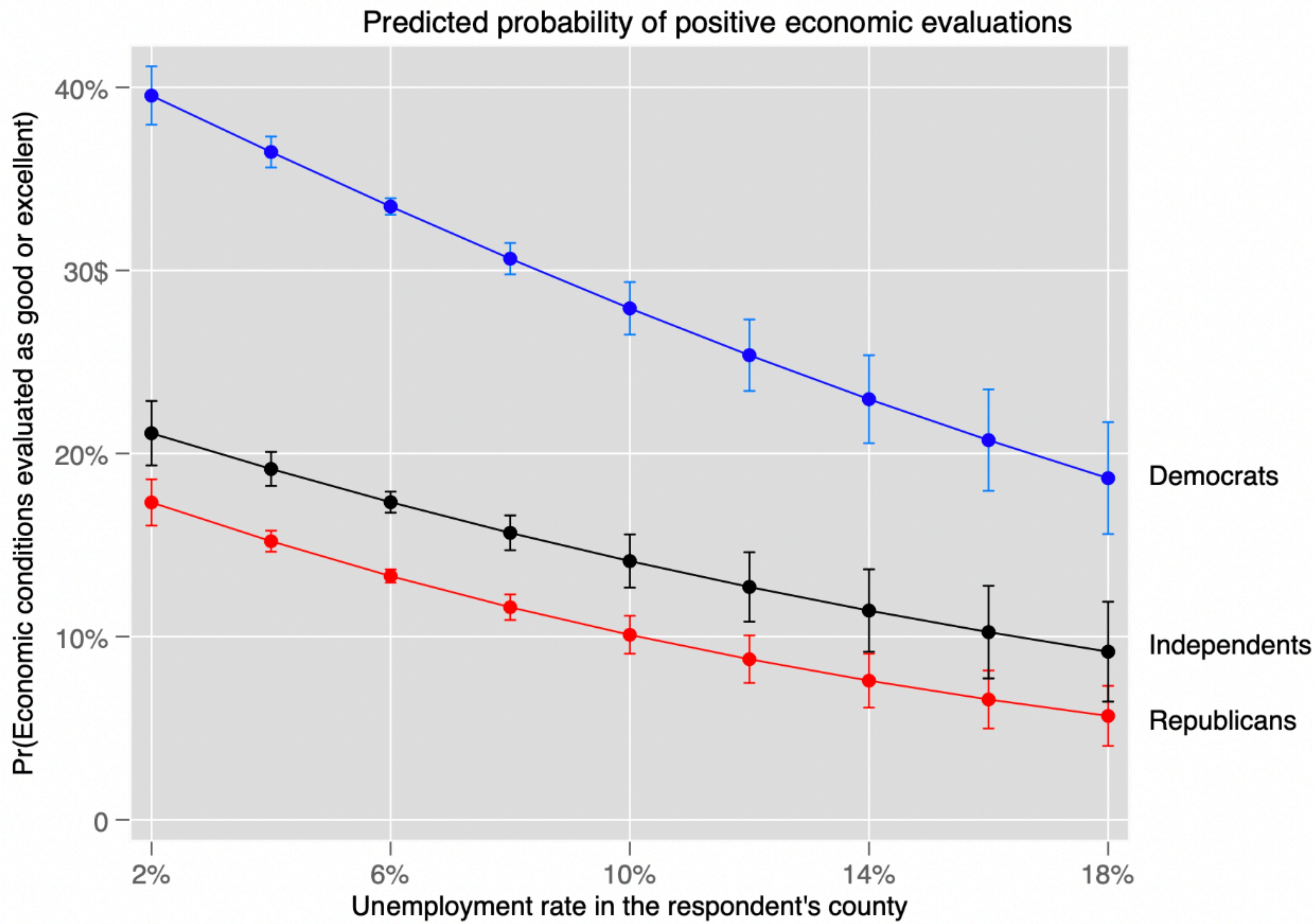
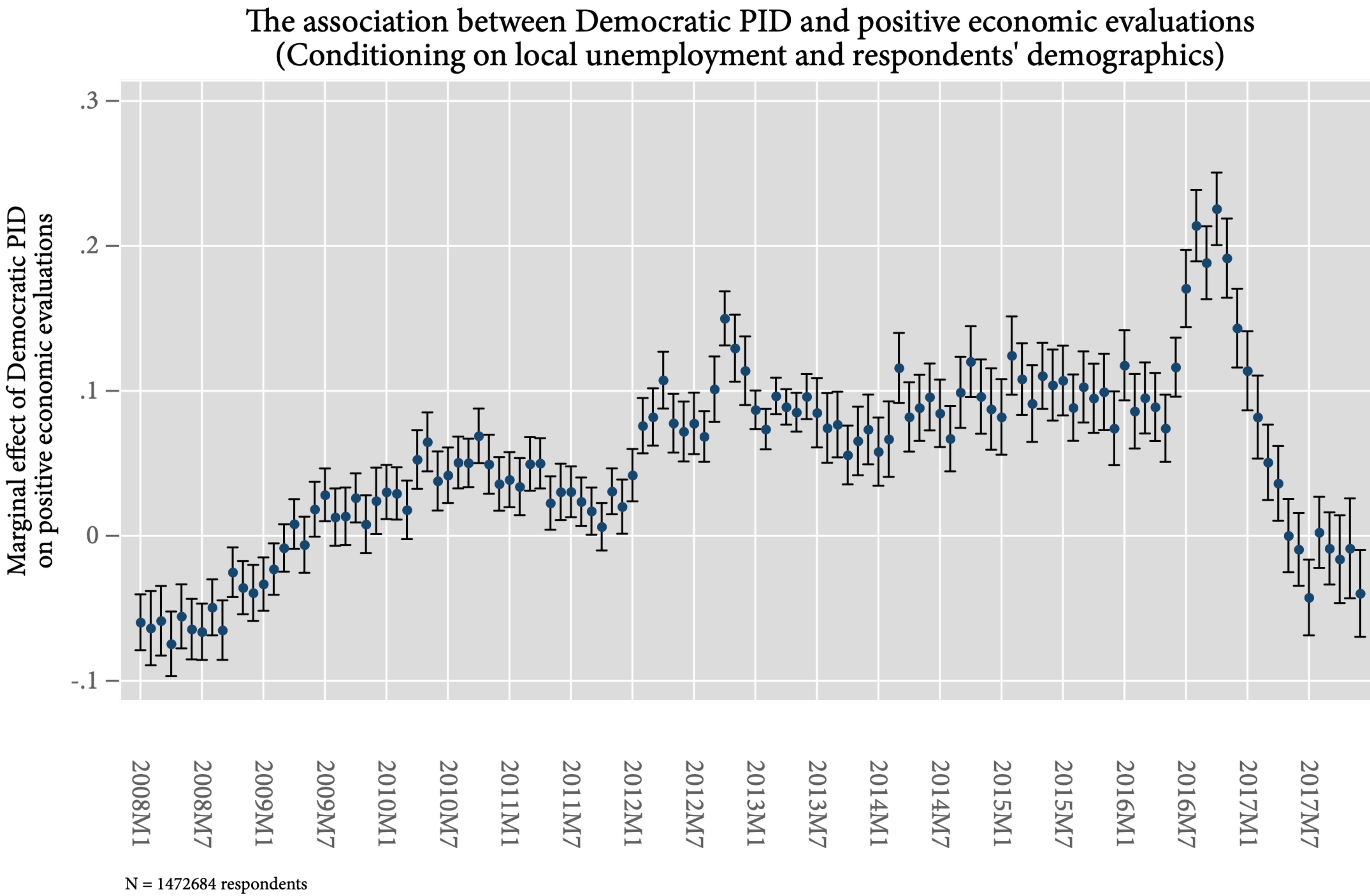
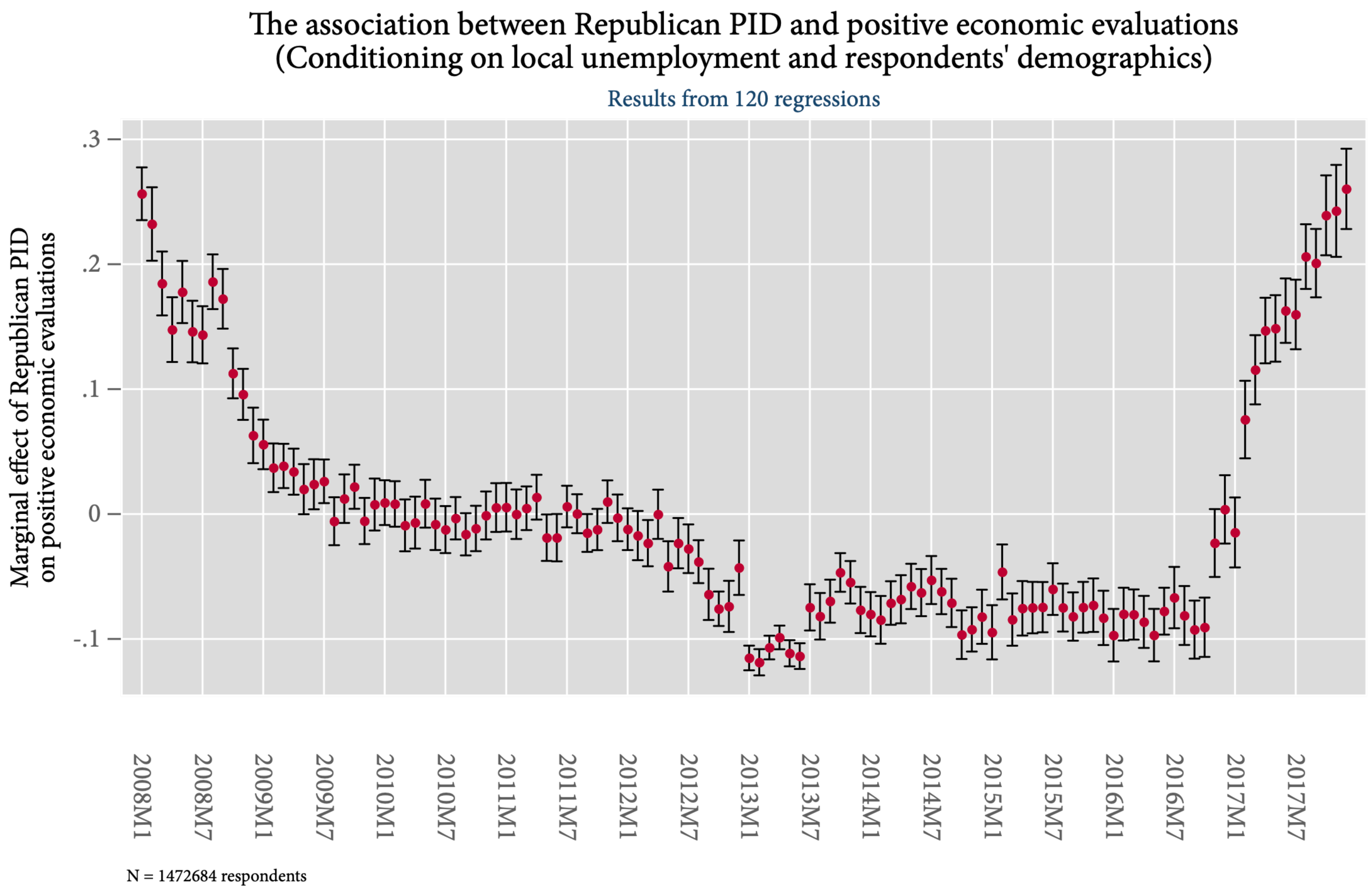


Figure 6: Predicted probability of positive economic evaluations by partisanship and by local economic conditions are based on a logistic regression where economic evaluations (=1 if positive) are regressed on local unemployment rate, and the labor force participation rate interacted with the party ID of each respondent. N = 236,915.


The association between Democratic PID and positive economic evaluations
(Conditioning on local unemployment and respondents' demographics)
Marginal effect of Democratic PID on positive economic evaluations
.3
.2
.1
0
-.1
2008M1
2008M7
2009M1
2009M7
2010M1
2010M7
2011M1
2011M7
2012M1
2012M7
2013M1
2013M7
2014M1
2014M7
2015M1
2015M7
2016M1
2016M7
2017M1
2017M7
N = 1472684 respondents


The association between Republican PID and positive economic evaluations
(Conditioning on local unemployment and respondents' demographics)
Results from 120 regressions
Marginal effect of Republican PID
on positive economic evaluations
.3
.2
.1
0
-.1
2008M1
2008M7
2009M1
2009M7
2010M1
2010M7
2011M1
2011M7
2012M1
2012M7
2013M1
2013M7
2014M1
2014M7
2015M1
2015M7
2016M1
2016M7
2017M1
2017M7
N = 1472684 respondents

Summary of results

- Across-party comparisons: evidence of bias
- Within-party comparisons suggest local economic conditions matter
- Prelim. evidence: local economy matters less over time

Conclusion

- Objective economic indicators and citizens' subjective economic evaluations are linked; voters notice the reality around them
- Economic variables interact and they do not map into perceptions linearly
- Some rules of thumb work well

Benefits of tree–based methods

- Identification of interactions
- Superior OOS predictions
- Uncover key predictors
- Theoretically interesting parameters