

SCIENTIFIC DATA ANALYSIS

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# Research Report



This project looks at how the most important **socioeconomic characteristics** of Dutch neighborhoods relate to **voting behavior** in the 2025 elections of the Tweede Kamer.

## RESEARCH QUESTION AND HYPOTHESES

**RQ** How do neighborhood socioeconomic status and migration-background composition shape (a) economic ideology voting and (b) migration-ideology voting, and do these effects depend on each other?

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**H1:** Higher-income municipalities tend to vote more economically center-right/right.

**H2:** Municipalities with a higher migration-background share differ systematically in migration-ideology voting, controlling for income and age structure

**H3:** The effect of income on economically right/center-right voting is moderated by migration-background share (income × migration interaction).

**DATA****Kerncijfers 2024 - StatLine****Data on municipalities**

Demographics, education,  
migrant population.

**Inkomen van huishoudens - 2025****Households' income**

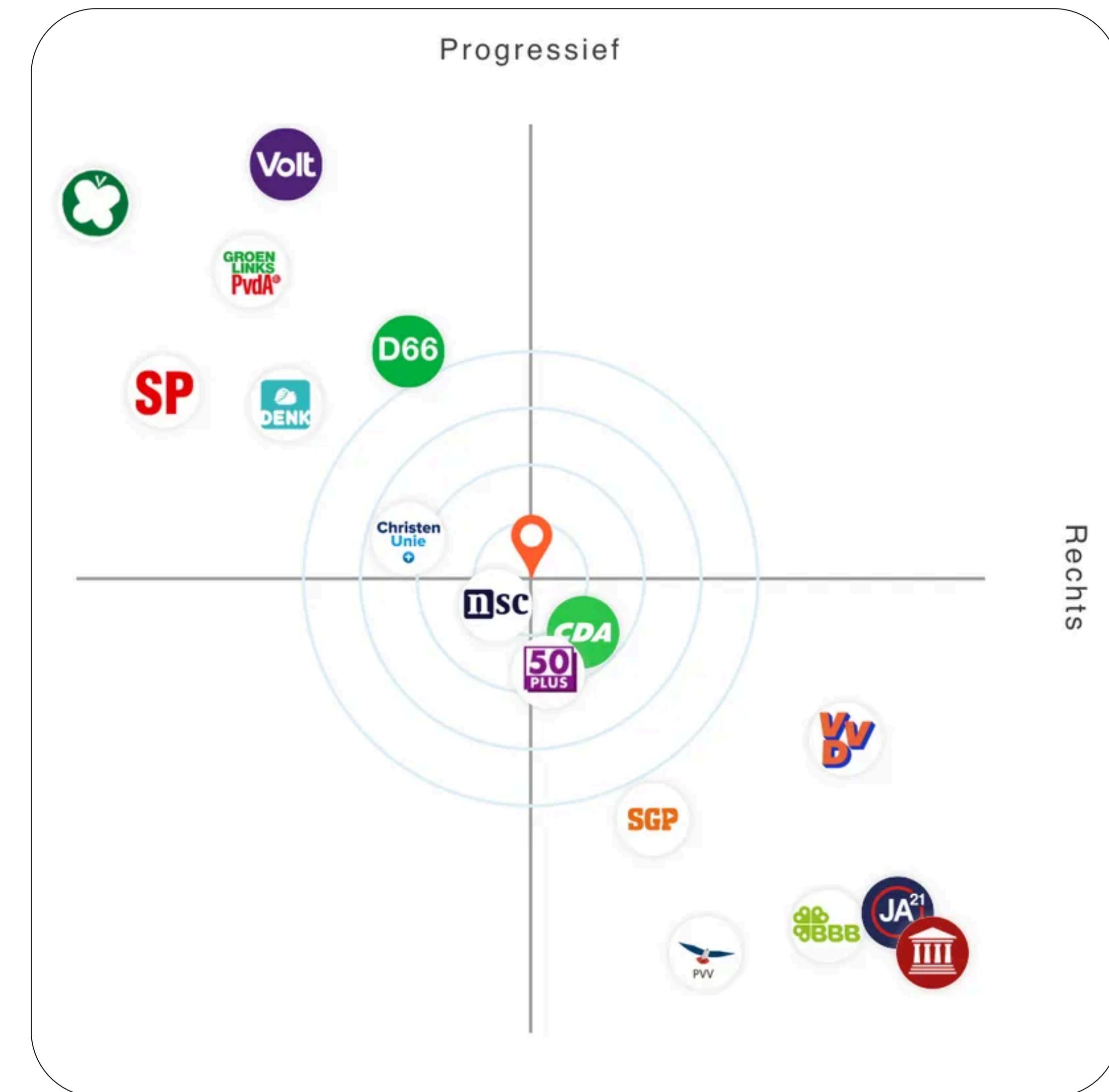
Median income data per  
municipality.

**Verkiezingsuitslagen 2025 - Kiesraad****Election results**

Percentage of votes for every party  
per municipality.

# Party distribution

To classify political parties into ideological groups, we used a two-dimensional framework that distinguishes between their economic positions (left–right) and their views on immigration and cultural issues (progressive–conservative). For the larger parties, this classification was based on their relative positions in the ideological space which we got from this figure. Smaller parties were not always clearly represented and were therefore classified using their party programs and policy statements.



## SAMPLE OF PARTY DISTRIBUTION

Name	Seats	Economic	Migration
D66	26	Center-left	Progressive
PVV	26	Right	Extreme conservative
VVD	22	Right	Conservative
GroenLinks/PVDA	20	Left	Extreme progressive
CDA	18	Center-right	Conservative
JA21	9	Right	Extreme conservative
Forum voor Democratie	7	Right	Extreme conservative
BBB	4	Right	Extreme conservative

STATISTICAL ANALYSIS

# Regressions

Initial model and tuning

## STRATEGY

Separate OLS  
regressions for each  
ideological block

Same RHS across  
models

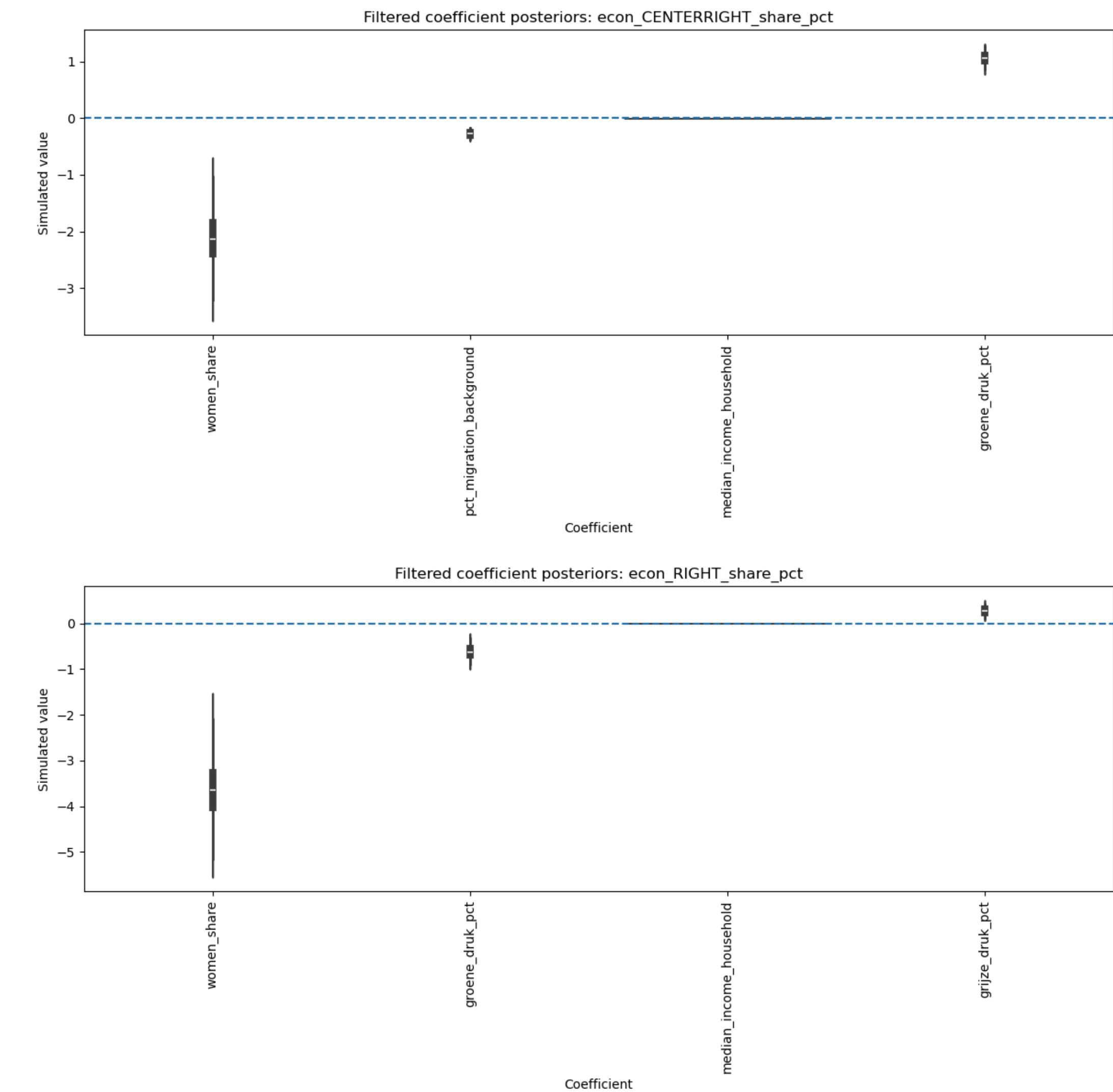
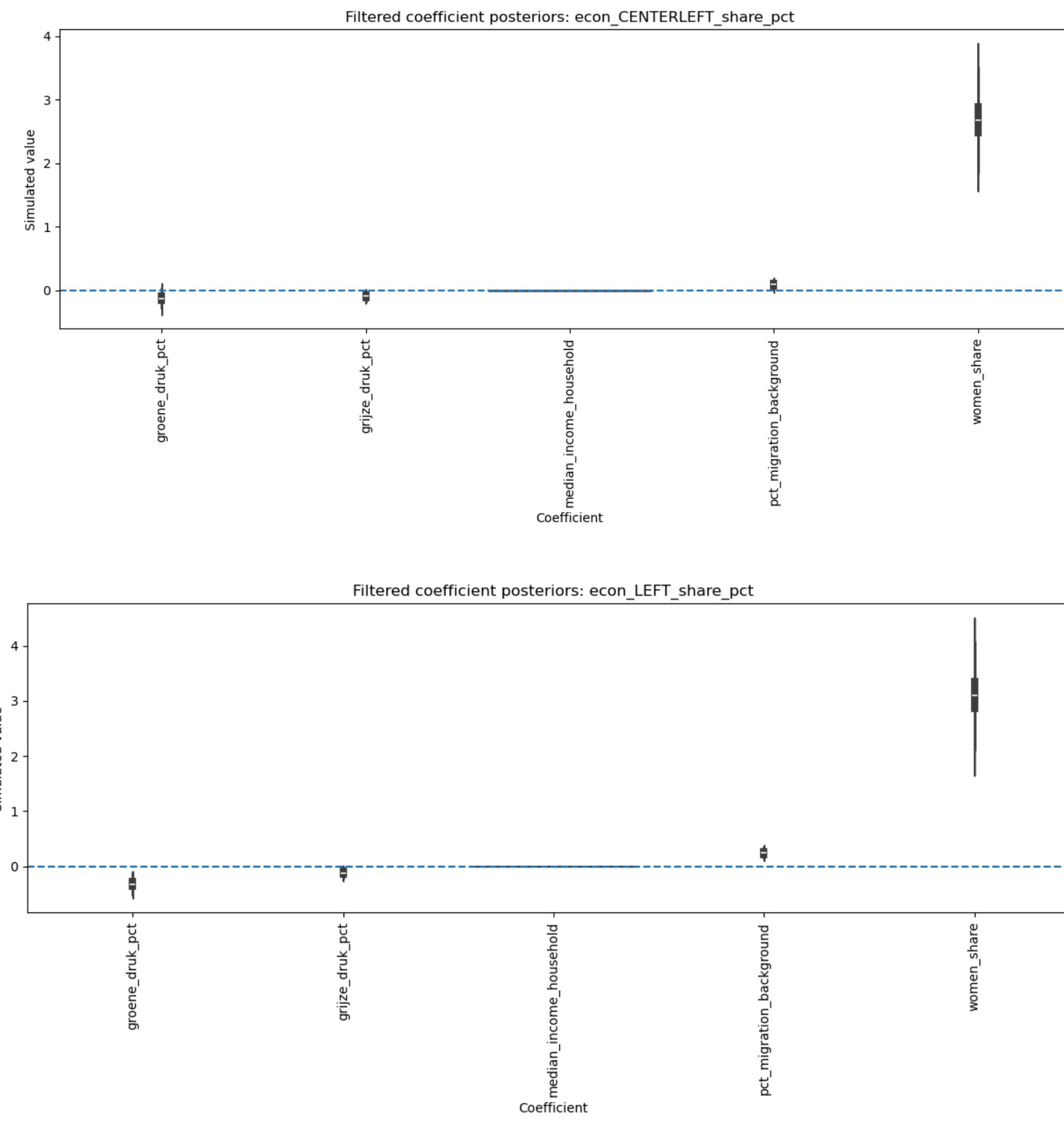
Robust SEs

Interaction model for H3

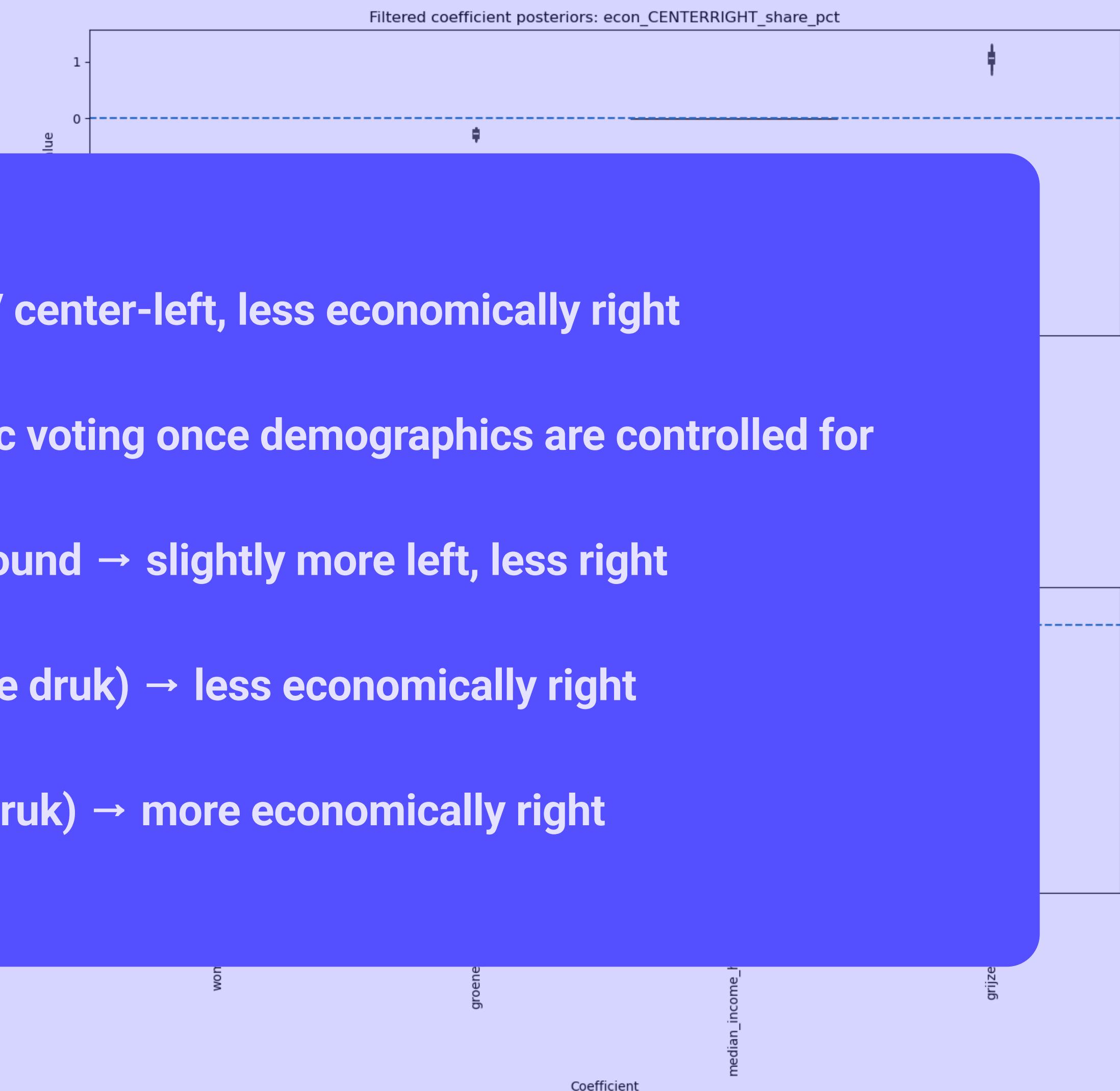
Monte Carlo simulation  
for uncertainty

**Vote shares  
are compositional,  
each ideological outcome is modeled separately**

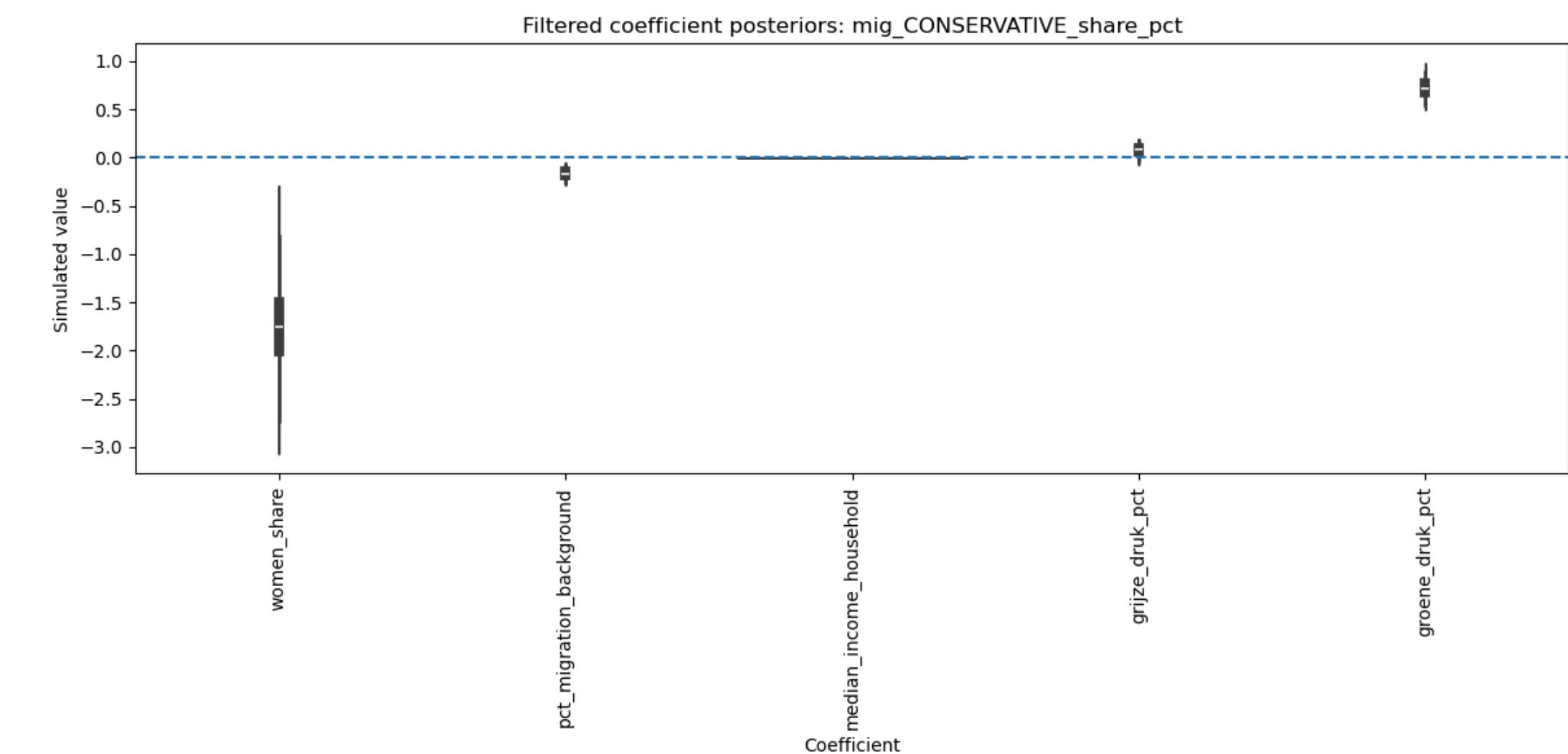
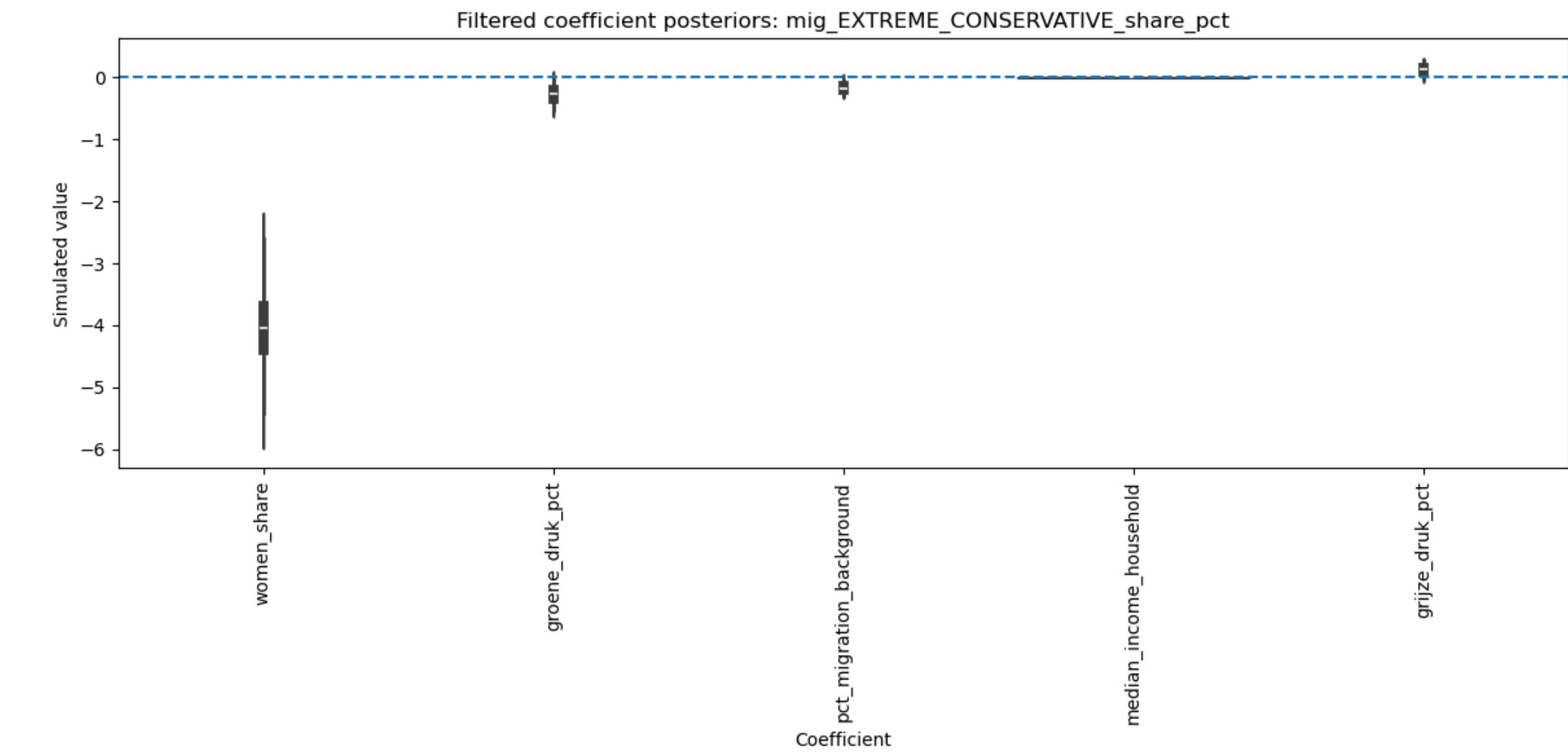
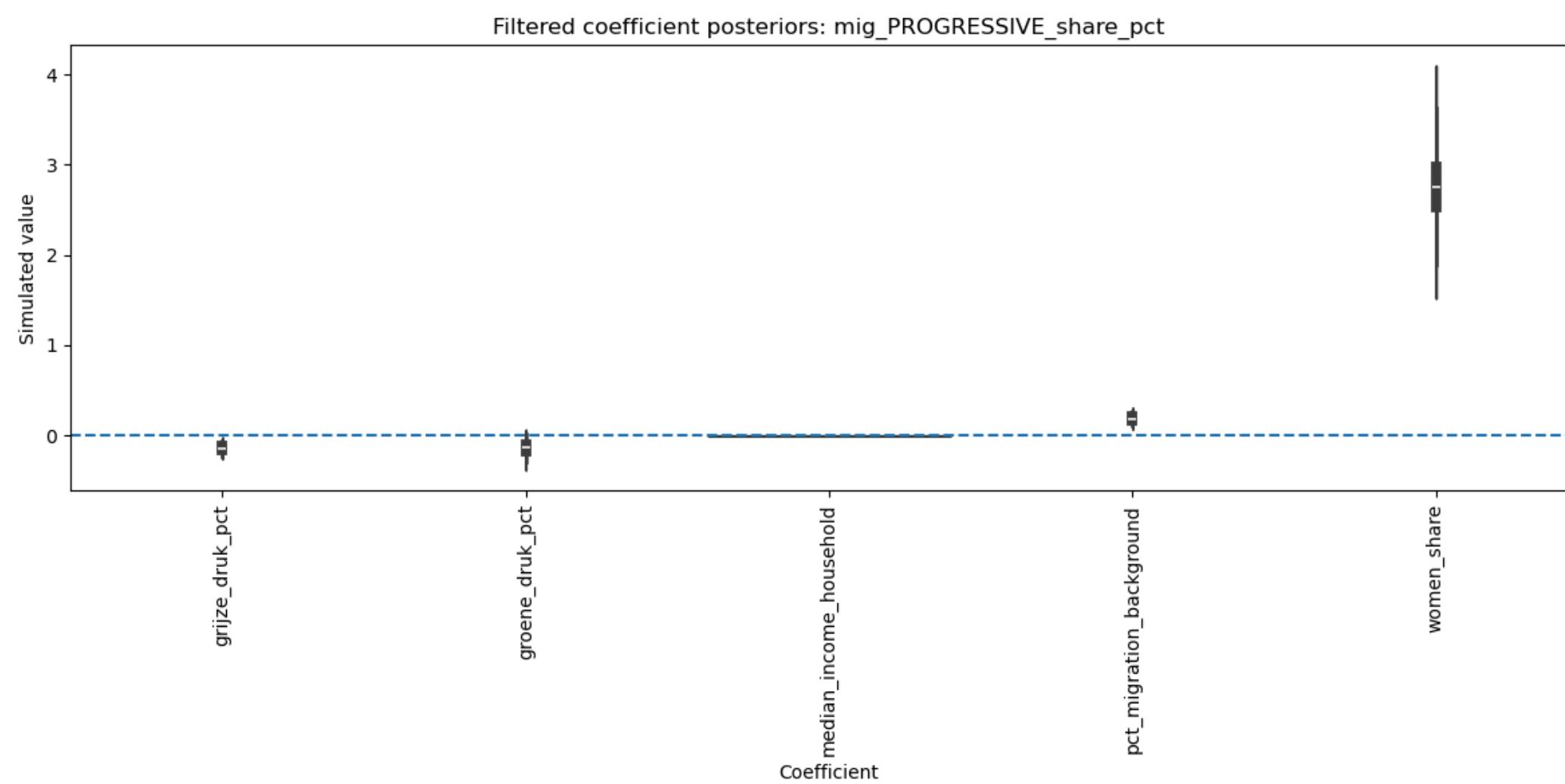
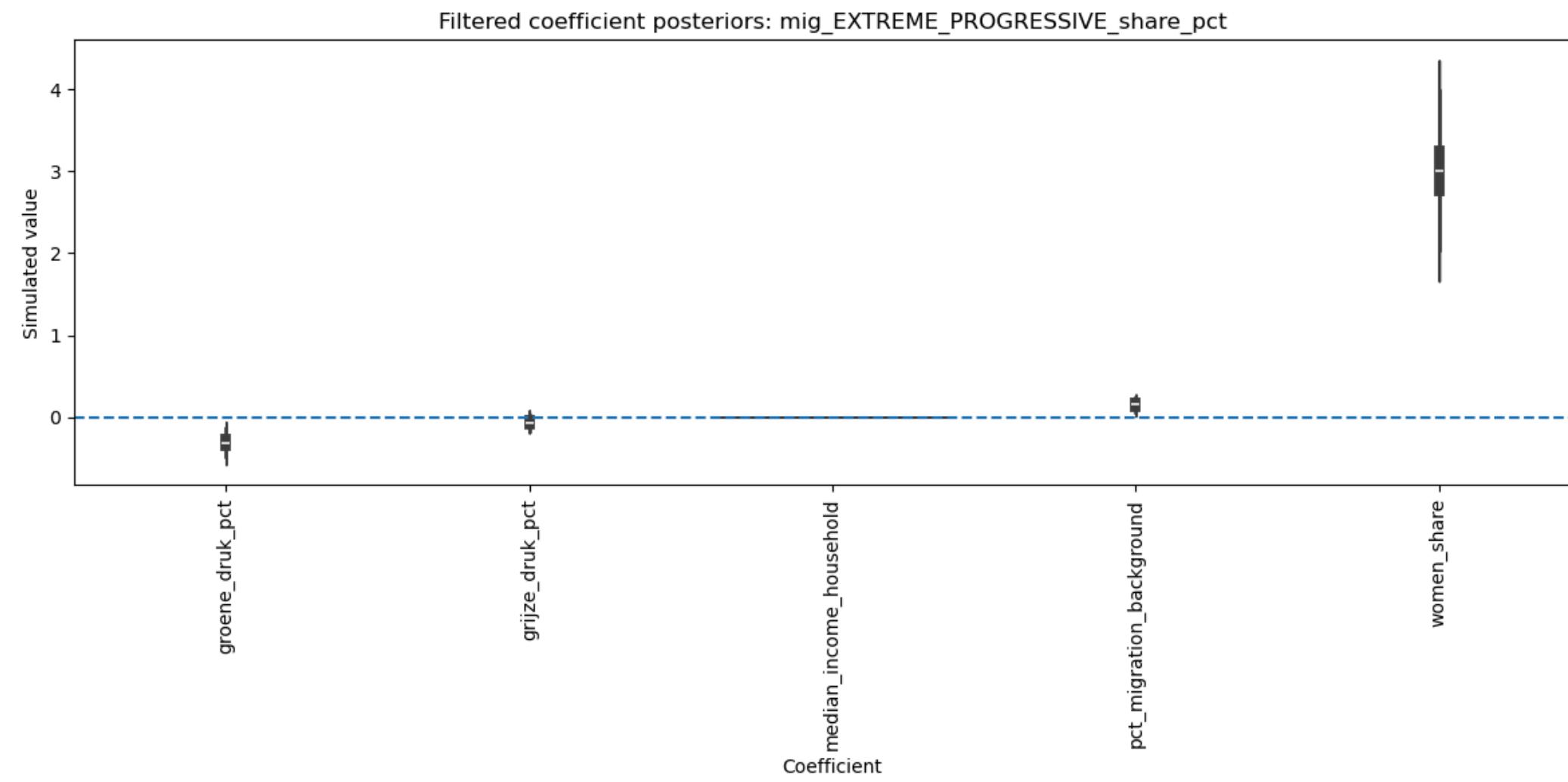
## ECONOMICAL MODELS' COEFFICIENTS



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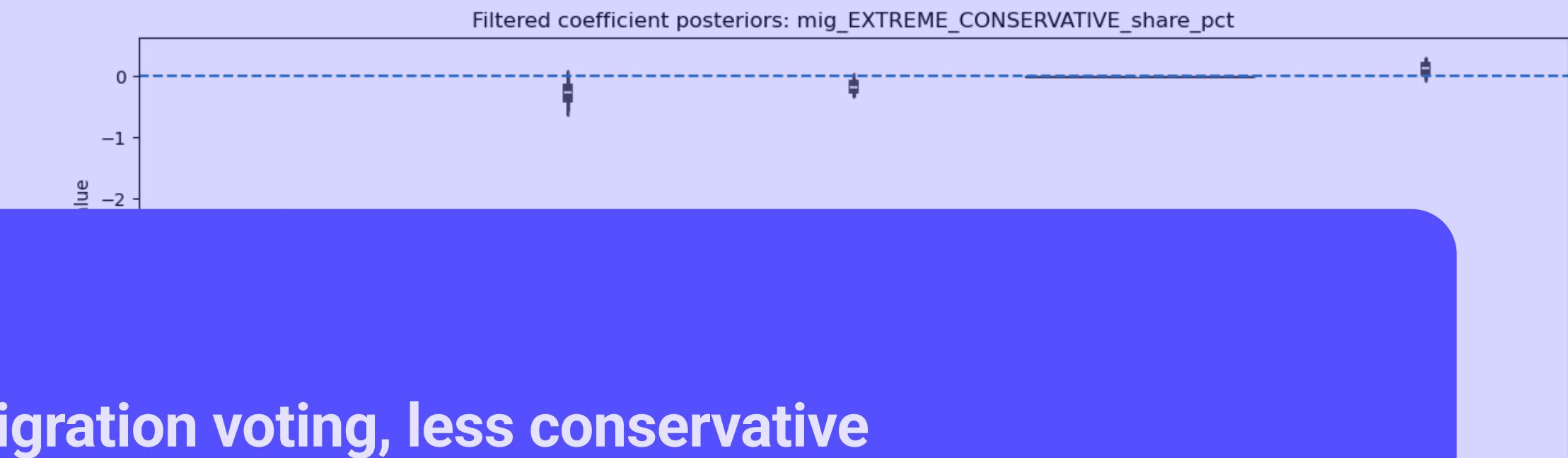
## MIGRATION MODELS' COEFFICIENTS



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**More women → more progressive migration voting, less conservative**



**Higher migration-background share → more progressive, less conservative migration voting**

**Income → no clear dependency once demographics are controlled for**



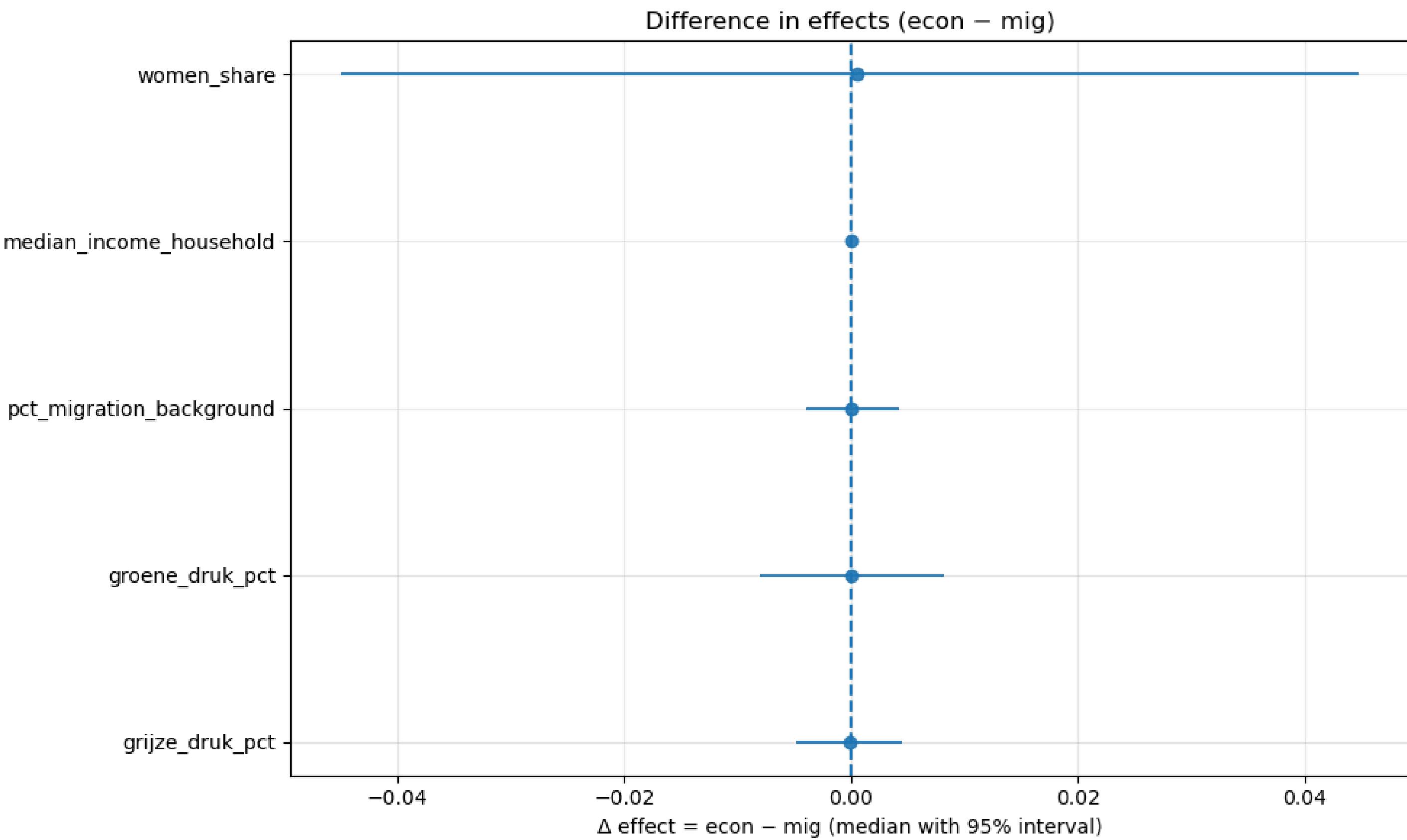
**Younger neighborhoods (higher groene druk) → more conservative migration voting**



**Older neighborhoods (higher grijze druk) → less progressive, more conservative voting**

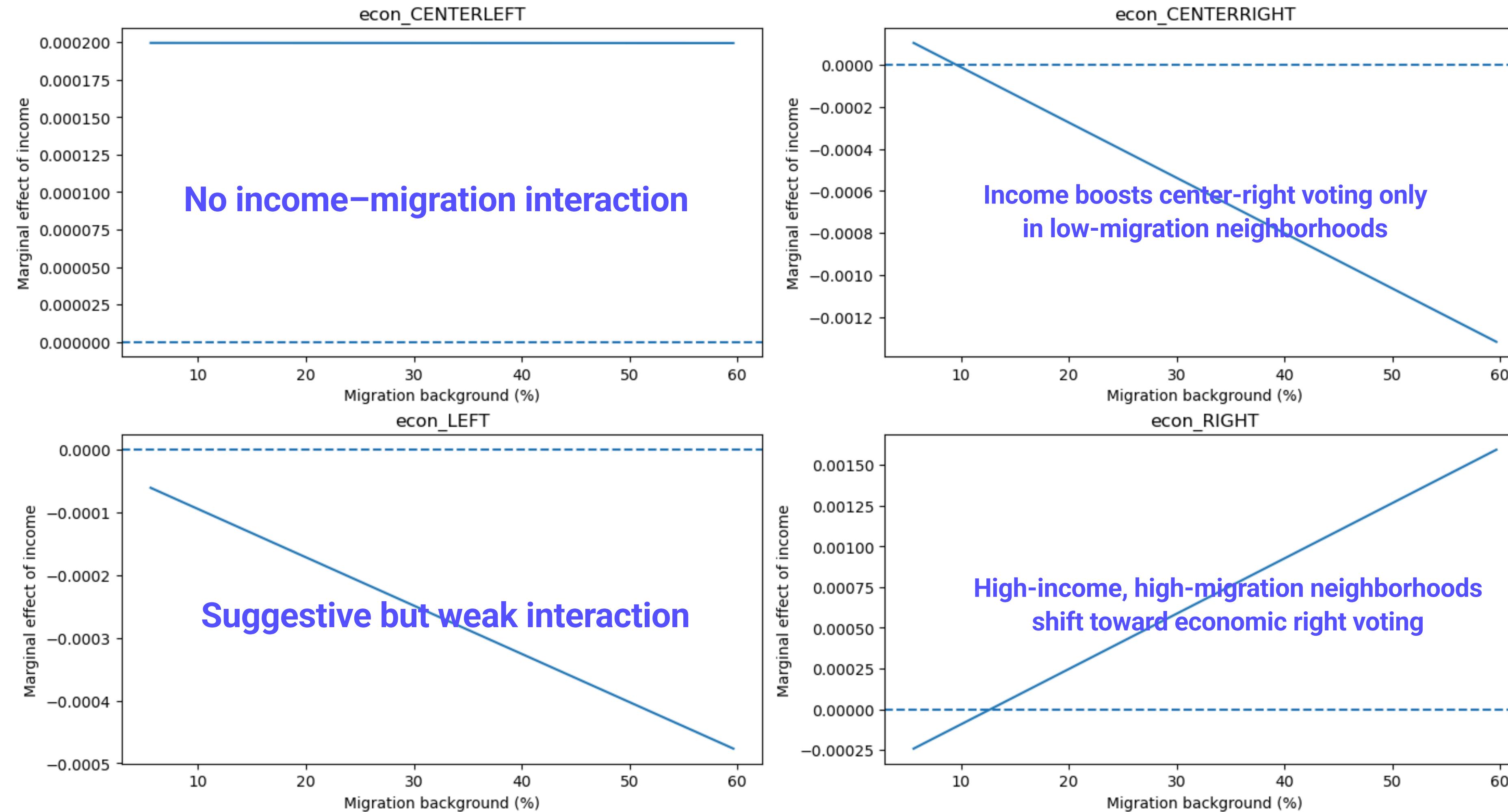
## MAGNITUDE COMPARISON

Here we compare the average magnitude of neighborhood effects across economic and migration voting dimensions. Results indicate that neighborhood characteristics do not systematically exert stronger influences on one ideological dimension than the other. Instead, differences between economic and migration voting arise primarily from the direction, interaction structure, and contextual dependence of effects, rather than from differences in overall effect size.



## INTERACTION ANALYSIS

Marginal Effect of Income by Migration Background  
(Economic Vote Shares)



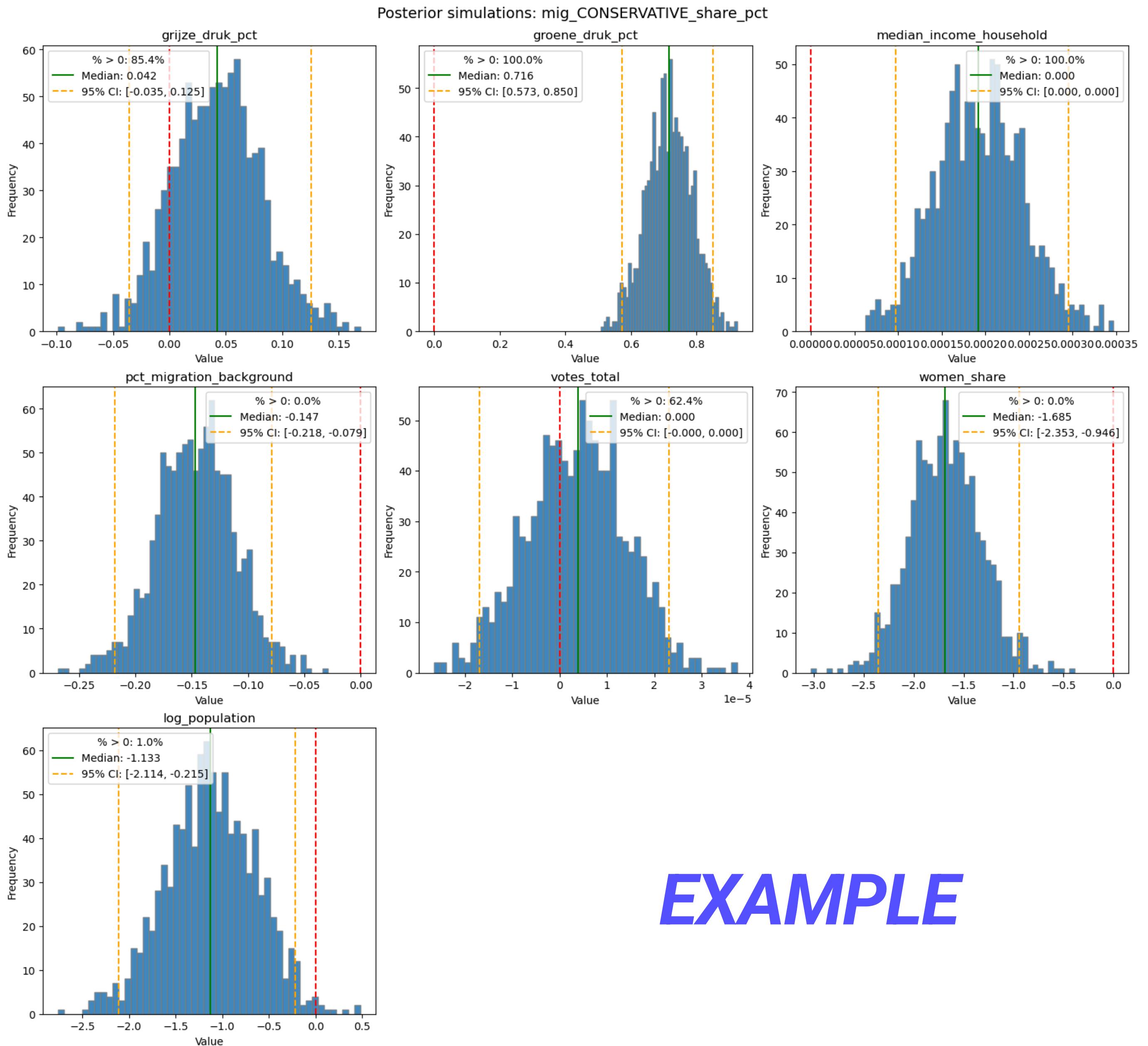
STATISTICAL ANALYSIS

# Model validation

Monte Carlo simulations

## POSTERIOR SIMULATIONS OF REGRESSION COEFFICIENTS

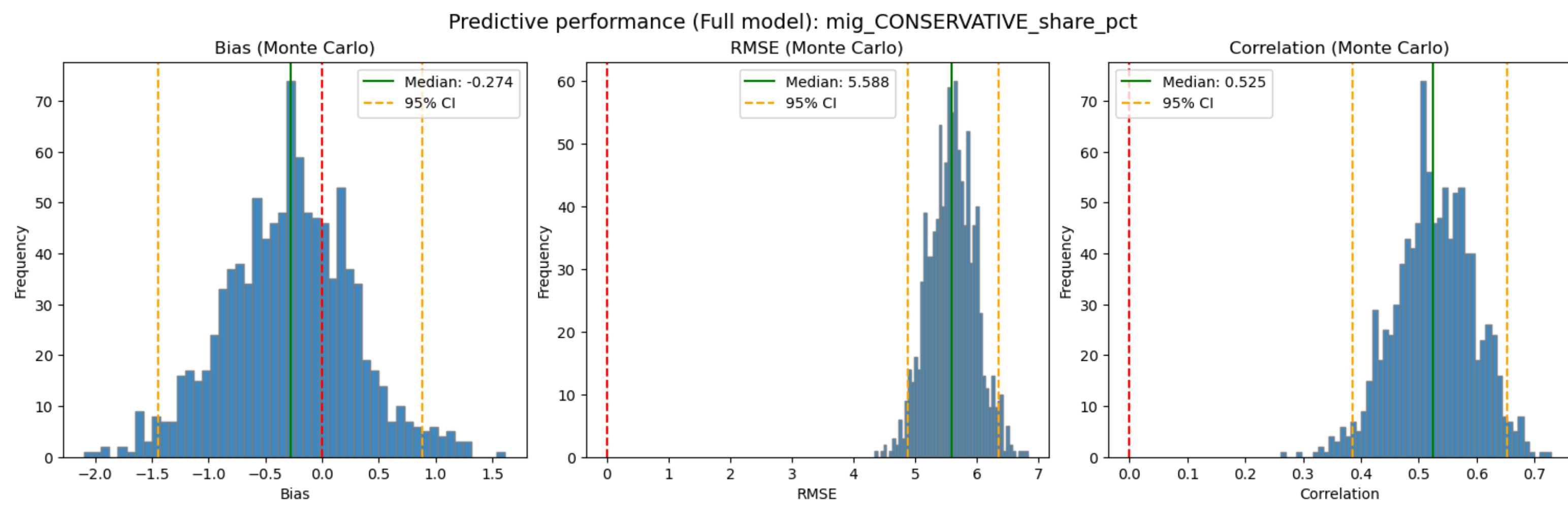
To assess uncertainty in the estimated relationships, we simulate regression coefficients from the estimated sampling distribution of the model parameters. This allows us to evaluate the stability, direction, and dispersion of coefficient estimates beyond point estimates alone. The simulated distributions indicate that key coefficients are well-behaved and consistently signed, suggesting that the estimated effects are not driven by sampling noise but reflect systematic patterns in the data.



# EXAMPLE

## MODEL VALIDATION VIA POSTERIOR PREDICTIVE SIMULATION

We evaluate model performance using posterior predictive simulation, generating predicted outcomes from the estimated model and comparing them to observed values. By examining the distributions of bias, RMSE, and correlation across simulations, we assess predictive stability and uncertainty. The results show moderate but stable predictive performance, indicating that the models are internally consistent and suitable for inference rather than optimized prediction.



# EXAMPLE

## RESULTS

Demographic composition is the *strongest predictor* of municipality voting patterns, with gender balance and age structure exerting *more consistent influence than income*.

Economic and migration voting represent distinct ideological dimensions: predictors exhibit similar average effect sizes across dimensions but differ in direction, interactions, and contextual dependence.

Municipalities with a higher share of women vote more economically left and more progressive on migration, while male-dominated municipalities lean toward economically and migration-conservative blocks.

Age structure shapes ideology asymmetrically: older municipalities (higher *grijze druk*) consistently support economically and migration-conservative parties, while younger municipalities lean away from economic conservatism, with weaker and less consistent effects on migration voting.

Income does not have a uniform political meaning at the municipality level; its association with voting depends on local context rather than acting as a simple left-right gradient.

Migration-background composition primarily structures migration-ideology voting, but also conditions how income translates into economic voting outcomes.