The Effects of Overconfidence on the Political and Financial Behavior of a Representative Sample

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What is Overconfidence?

Three types of overconfidence (Moore and Healy, 2008):

- Overestimation: overconfidence in one's performance
- Overplacement: overconfidence in relative standing
- **Overprecision: excess of confidence in own beliefs**
  - Relates to the second moment of the distribution
  - Variance of $X_i|y_i$ strictly less than variance of X_i given y_i

What do we do?

We jointly study how **overprecision** correlates with **political and financial behavior** in a **representative sample**.

How do we do it?

We take predictions from theory to a representative sample:

1. **New method** to measure overprecision (*The Subjective Error Method*)
2. **Representative sample** (the 2018 **SOEP-IS**)
3. **Test predictions** from the theoretical literature

   Preview of results:
   - lower portfolio diversification
   - larger stock price forecasting errors
   - more extreme political views
   - higher likelihood of not voting*

▸ OS2015

Subjective Error Method

Subjective Error Method

The **Subjective Error Method** (SEM) consists in asking respondents two questions:

1. is a question with a numerical answer (Good: length of the Nile, Bad: gender of the current prime minister of the UK)
2. asks how far away they expect their answer to question (1) to be from the true answer.

By **comparing the subjective *reported error* of respondents to their *realized error***, we get a numerical measure of how over-/underprecise the respondent is.

Formal Subjective Error Method

Formally:

- call the answer of respondent i to question $j \rightarrow a_{i,j}$
- call the true answer to question $j \rightarrow ta_j$
- call the reported error for question $j \rightarrow re_{i,j}$

Then:

$$error_{i,j} = |a_{i,j} - ta_j|, \tag{1}$$

$$overprecision_{i,j} = error_{i,j} - re_{i,j}, \tag{2}$$

▸ Illustration

The SOEP-IS

The SOEP-IS

Innovation Sample of the German Socio-Economic Panel.

- 2018 wave: 4,860 respondents across 3,232 households.
- Specific subset: 902 subjects across 634 households.
- **Final sample: 805 subjects across 584 households.**
- Representative sample. test

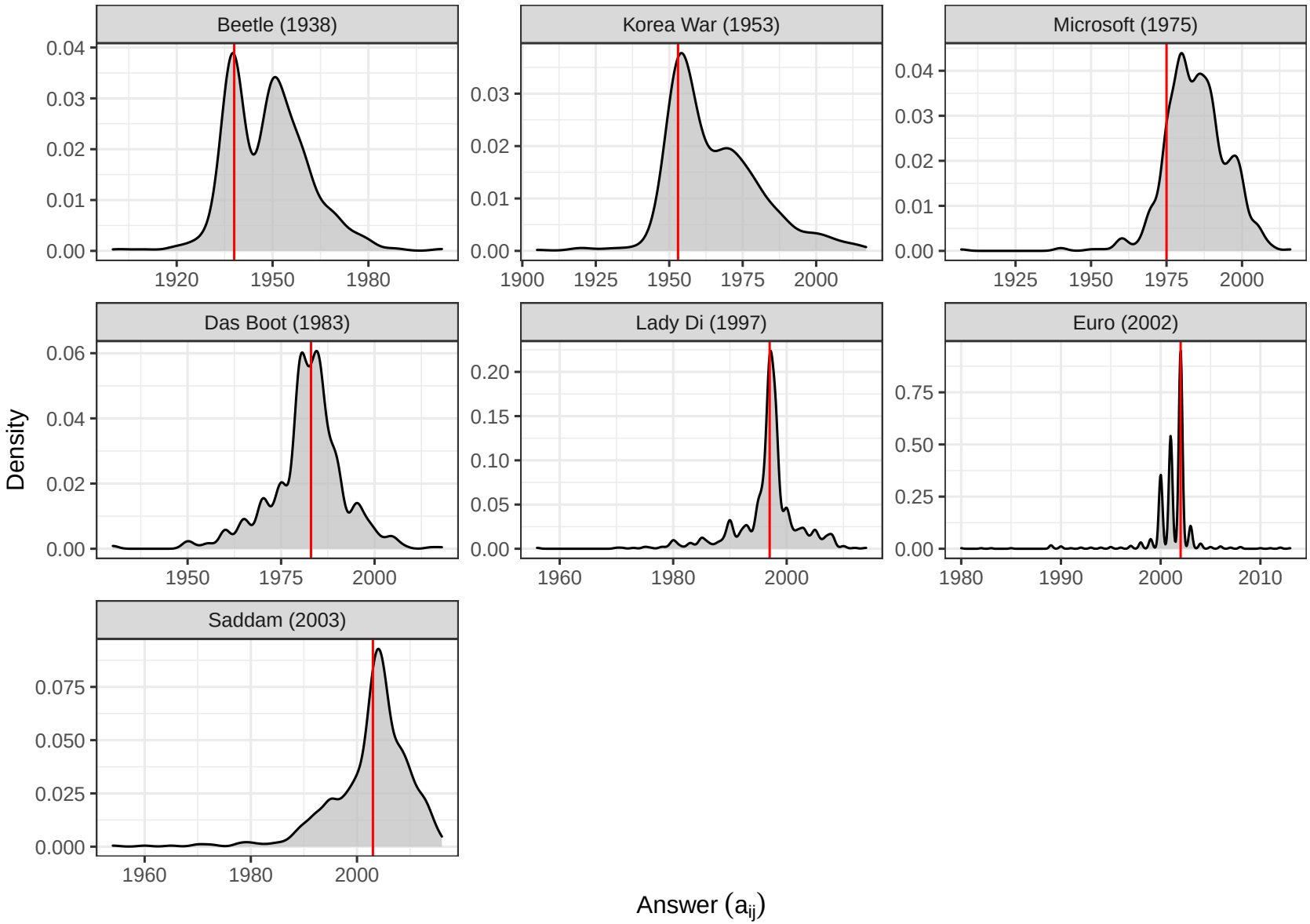
The Questions

Seven different questions divided into two sub-questions:

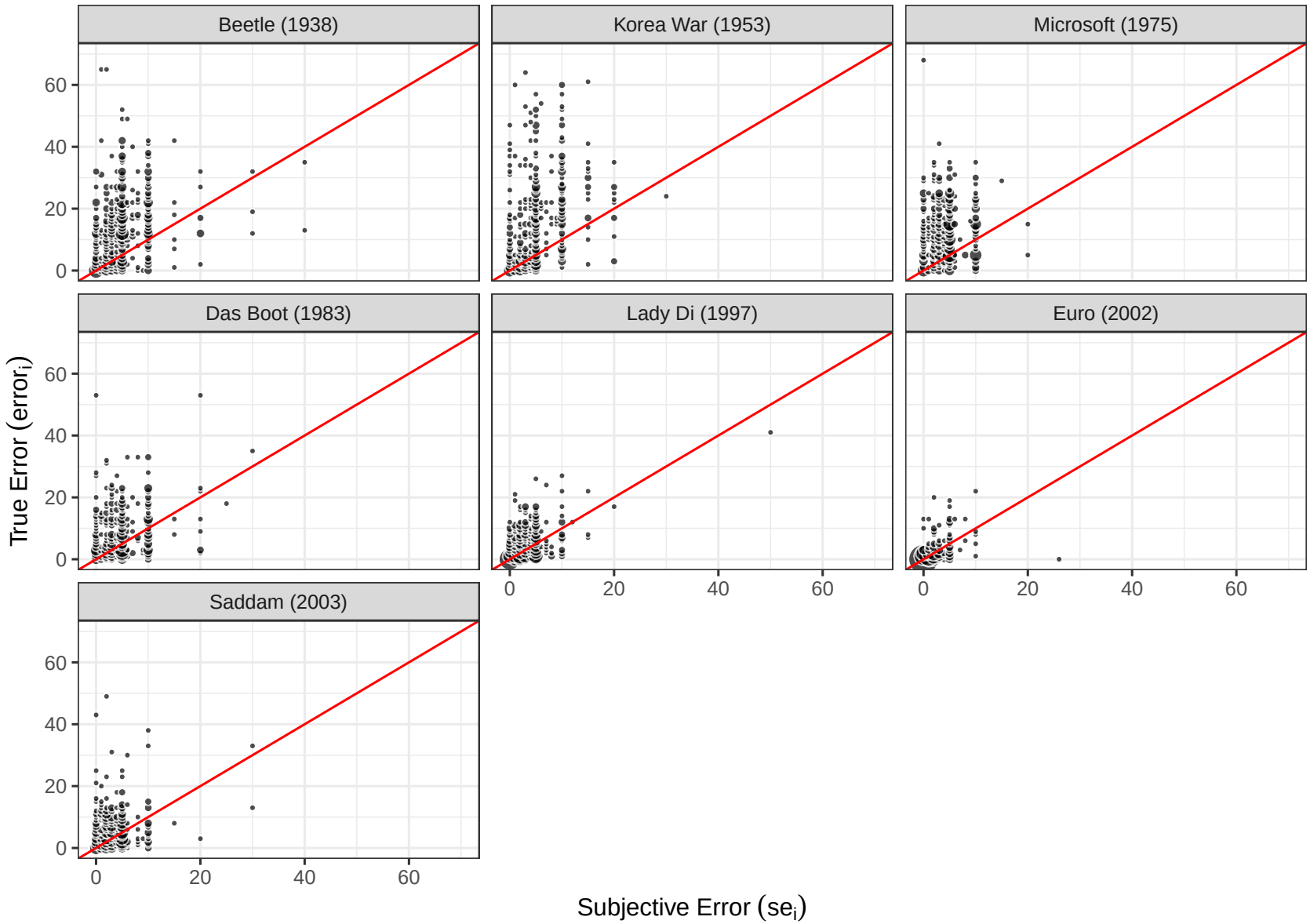
1. the year of a specific historical event that occurred not further away than 100 years ▸ questions
2. the distance (in years) between their answer to (1) and the correct answer to (1)

Results

Answers


Beetle (1938)
Korea War (1953)
Microsoft (1975)
Das Boot (1983)
Lady Di (1997)
Euro (2002)
Saddam (2003)
Density
Answer (a_{ij})

True and Subjective Error



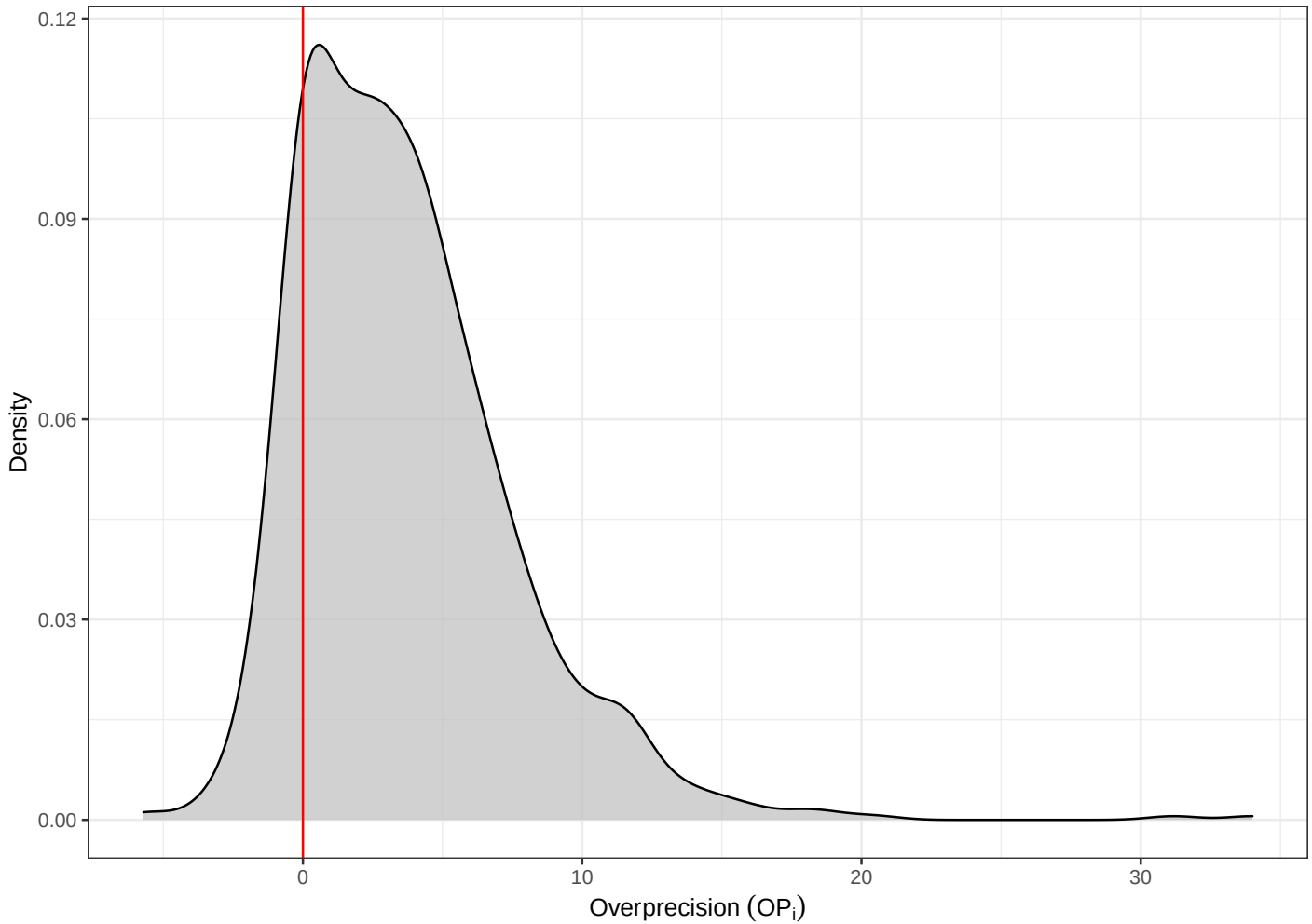
First Take Away

Two take aways from the raw data:

1. The questions **differ in the difficulty**, with some questions being easier than others
2. **Respondents are overprecise** in their answers across questions

Internal consistency: Congeneric reliability (Cho, 2016) → .76

Aggregate measure



(a) All respondents (N=805)

▸ answers ▸ determinants

Standardized Measure OLS

Dependent Variable: Sop	(1)	(2)	(3)	(4)
Age	-0.008***	-0.007***	-0.007**	-0.007**
	(0.002)	(0.002)	(0.003)	(0.003)
Female	0.085	0.132*	0.103	0.082
	(0.069)	(0.070)	(0.073)	(0.072)
Years Education	-0.053***	-0.063***	-0.050***	-0.044***
	(0.013)	(0.013)	(0.014)	(0.014)
Answered		0.063***	0.066***	0.070***
		(0.020)	(0.020)	(0.021)
Gross Income			-0.051**	-0.051**
			(0.023)	(0.023)
Constant	1.056***	0.772***	0.652**	0.502
	(0.209)	(0.227)	(0.311)	(0.377)
N	805	805	805	805
adj. R^2	0.035	0.046	0.060	0.083
Fixed Effects	No	No	No	Yes
Employment Status Dummy	No	No	Yes	Yes

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

▸ graph 1 ▸ graph 2 ▸ robustness

More Interesting Results

Theoretical Predictions

Examine theoretical predictions regarding overprecision in:

- Financial market behavior and beliefs
- Politics

Three approaches :

1. **OLS** using a vector of controls + overprecision → point estimate of overprecision and p-value
2. $\mathbf{R^2}$ **rank** (Cobb-Clark et al., 2019) → rank explanatory power of variables
3. **LASSO** → select if overprecision in the set of variables with predictive power

	(1) Point estimate	(2) Unadj. p-value	(3) SH p-value	(4) R^2 rank	(5) LASSO included	(6) LASSO R^2	(7) N
A Prediction error:							
err_dax	1.153**	0.022	0.105	2/38	yes/15	0.15	578
opt_dax	0.091***	0.009	0.061	3/38	yes/11	0.39	578
err_rent	0.348*	0.051	0.145	2/38	yes/13	0.07	670
err_buy	0.160	0.264	0.458	9/38	no/0	0.00	644
B Diversification:							
std_divers	-0.129***	0.000	0.000	3/38	yes/19	0.13	774
C Ideological Positioning:							
std_extreme	0.091**	0.032	0.122	6/39	yes/13	0.05	716
std_lr	-0.011	0.801	0.801	18/39	no/11	0.07	716
D Voting behavior:							
non_voter	0.032***	0.010	0.059	3/39	yes/18	0.14	706

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Column 1 lists the point estimate of the standardized overprecision measure. Column 2 the unadjusted p-value. Column 3 the Sidak-Holm adjusted p-value. Column 4 the result from the R^2 procedure along the maximum possible variables in the model. Column 5 specifies the result of the LASSO procedure. Column 6 the R^2 of the estimated model . The number of observations (Column 7) varies due to missing observations in the outcome variable.

Financial Market Predictions (I)

Hypothesis 1: Overprecision & financial markets

Theory predicts that:

- more overprecise respondents will make more **incorrect price predictions** in **financial markets** (e.g., Benos, 1998; Odean, 1998).

- more overprecise respondents will make more **incorrect predictions** regarding the development of **real estate markets** (Hayunga and Lung, 2011)
  - rent
  - buy

Results

	(1) Point estimate	(2) Unadj. p-value	(3) SH p-value	(4) R^2 rank	(5) LASSO included	(6) LASSO R^2	(7) N
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Financial Market Predictions (II)

Hypothesis 2: Overprecision & Porfolio Diversification

Theory predicts that:

- more overprecise respondents will have more **underdiversified portfolios** (Odean, 1998; Barber and Odean, 2000)

Results

	(1) Point estimate	(2) Unadj. p-value	(3) SH p-value	(4) R^2 rank	(5) LASSO included	(6) LASSO R^2	(7) N
A Prediction error:							
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Ideological Positioning

Hypothesis 3: Overprecision & political beliefs

Theory predicts that:

- overprecision leads to **political extremeness** (Ortoleva and Snowberg, 2015)
- there is **no correlation** with **political inclination** (left/right) in non-election years (Ortoleva and Snowberg, 2015)

Results

	(1) Point estimate	(2) Unadj. p-value	(3) SH p-value	(4) R^2 rank	(5) LASSO included	(6) LASSO R^2	(7) N
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Voting Behavior

Hypothesis 4: Overprecision & Voting behavior

Theory predicts that:

- overprecision leads to **higher likelihood to vote** (Ortoleva and Snowberg, 2015)

Results

	(1) Point estimate	(2) Unadj. p-value	(3) SH p-value	(4) R^2 rank	(5) LASSO included	(6) LASSO R^2	(7) N
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Robustness

Results are robust to alternative specifications of SEM:

- Residual measure
- Relative measure ▸ relative
- Standardized measure
- Age-robust measure
- Centered measure

Conclusion

Summary

We study how **overconfidence** correlates with the **political/financial behavior** of a representative sample of the German population:

- We introduce the **Subjective Error Method** as a new way to measure the overprecision of survey respondents.
- **Confirm predictions from theory** using a nationally representative sample.

Thank you for your attention!

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Appendix

How to measure overprecision?

- Most common: confidence intervals (CI) for a series of numerical questions (Alpert and Raiffa, 1982)
- Two-alternative forced-choice: respondents choose between two possible answers and then indicate confidence (Moore et al., 2015; Griffin and Brenner, 2004)
- Elicit complete probability distributions from respondents (Haran et al., 2010)

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What has been done?

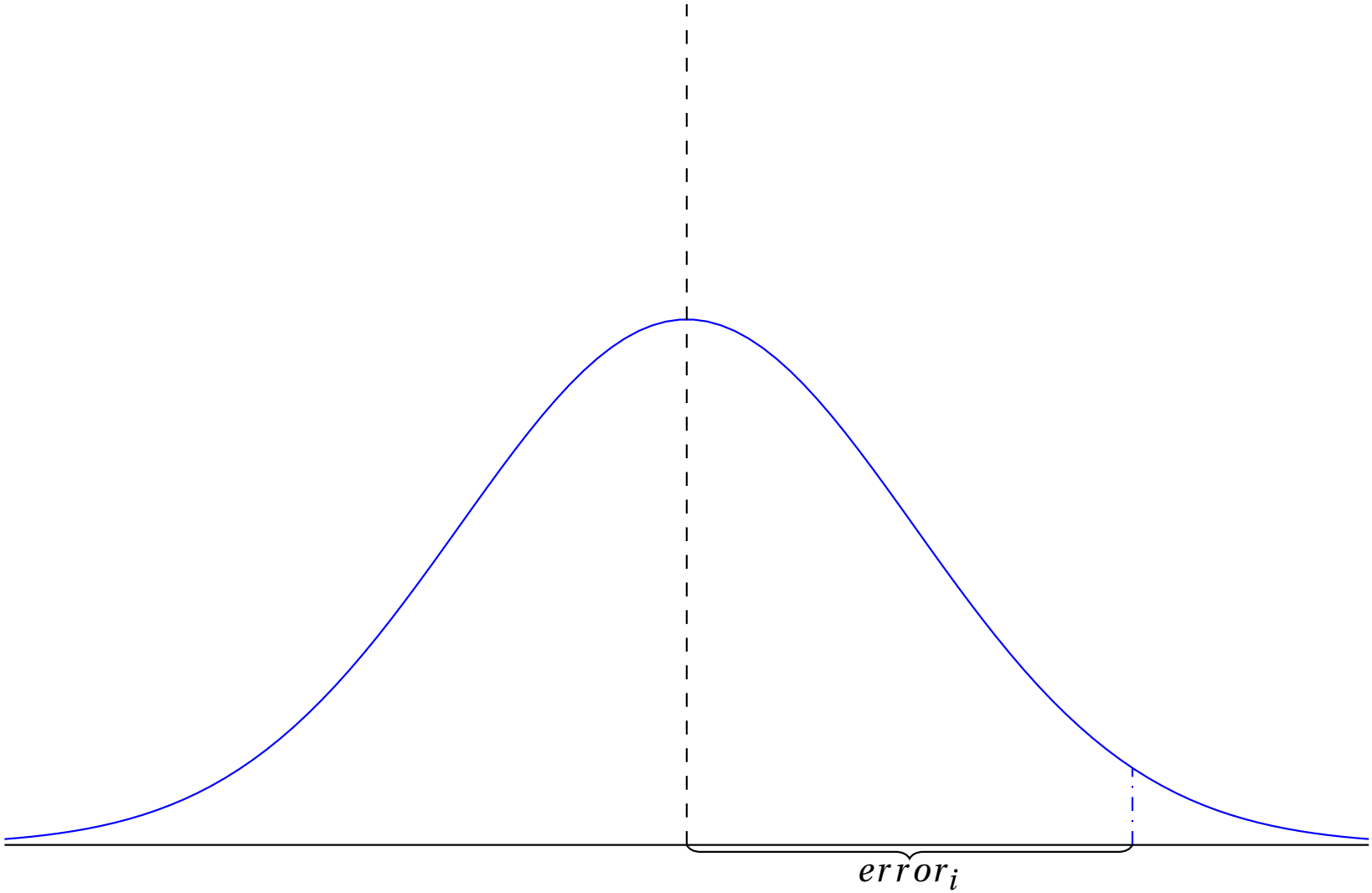
One paper related to ours:

- Ortoleva and Snowberg (2015) estimate a measure of individual overprecision using a representative sample of the US.

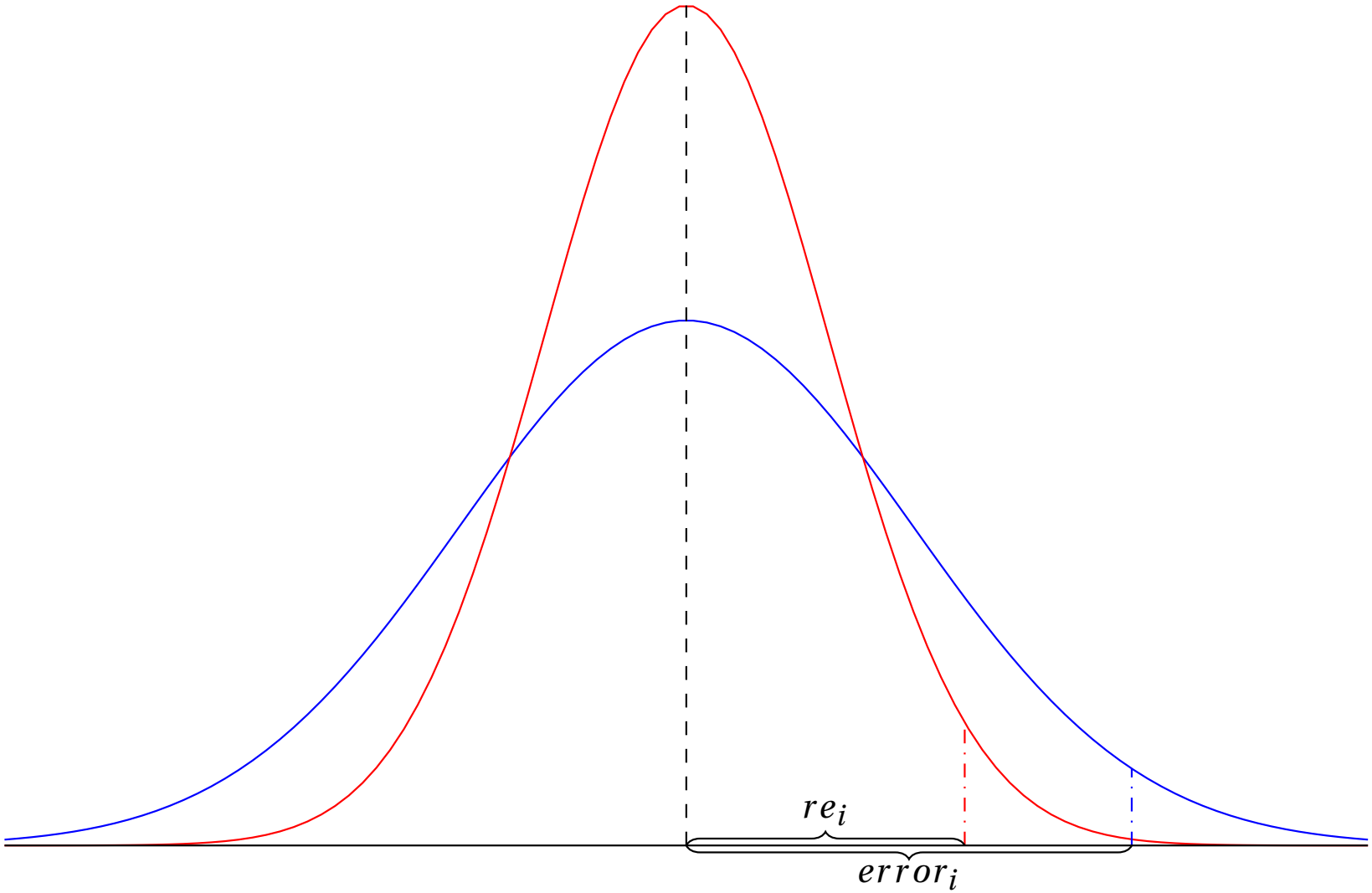
However,

- they focus on political preferences and voting behavior while **we include data on financial behavior**
- they *estimate* the individual measure of oveprecision of respondents, we **directly elicit overprecision**

Illustration



Illustration



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Representativeness test

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	SOEP IS		SOEP Core		Difference		
	mean	sd	mean	sd	difference	p-value	N[Core]
Age	53.914	(0.627)	50.535	(0.180)	-3.379	0.000	30,997
Gender	0.508	(0.018)	0.508	(0.005)	0.000	0.989	30,997
German	0.933	(0.009)	0.877	(0.003)	-0.056	0.000	30,997
East (current)	0.174	(0.013)	0.172	(0.003)	-0.002	0.916	30,997
East (1989)	0.186	(0.014)	0.198	(0.004)	0.012	0.404	24,591
Years Education	12.704	(0.098)	17.276	(0.027)	-.428	0.000	28,482
Employed	0.537	(0.018)	0.603	(0.005)	0.067	0.000	30,967
Retired	0.229	(0.015)	0.221	(0.004)	-0.007	0.627	30,967
Unemployed	0.037	(0.007)	0.042	(0.002)	0.005	0.490	30,697
Gross Income	2.943	(0.112)	2.837	(0.029)	-0.106	0.359	17,829
Married	0.568	(0.017)	0.521	(0.005)	-0.047	0.009	30,896
N[SOEP IS]	805						

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The Questions

Question	Answer
In welchem Jahr wurden Euro-Geldscheine und -Münzen eingeführt?	–
In welchem Jahr wurde das Unternehmen Microsoft (Herausgeber des Betriebssystems Windows) gegründet?	–
In welchem Jahr kam der Film “Das Boot” (Regie: Wolfgang Petersen) in die deutschen Kinos?	–
In welchem Jahr wurde Saddam Hussein von der US-Armee gefangen genommen?	–
In welchem Jahr wurde der erste Volkswagen Typ 1(auch bekannt als “Käfer”) produziert?	–
In welchem Jahr endete der Korea-Krieg mit einem Waffenstillstand?	–
In welchem Jahr starb Lady Diana, die erste Frau von Prinz Charles?	–

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The Questions

Question	Answer
In welchem Jahr wurden Euro-Geldscheine und -Münzen eingeführt?	2002
In welchem Jahr wurde das Unternehmen Microsoft (Herausgeber des Betriebssystems Windows) gegründet?	1975
In welchem Jahr kam der Film “Das Boot” (Regie: Wolfgang Petersen) in die deutschen Kinos?	1983
In welchem Jahr wurde Saddam Hussein von der US-Armee gefangen genommen?	2003
In welchem Jahr wurde der erste Volkswagen Typ 1(auch bekannt als “Käfer”) produziert?	1938
In welchem Jahr endete der Korea-Krieg mit einem Waffenstillstand?	1953
In welchem Jahr starb Lady Diana, die erste Frau von Prinz Charles?	1997

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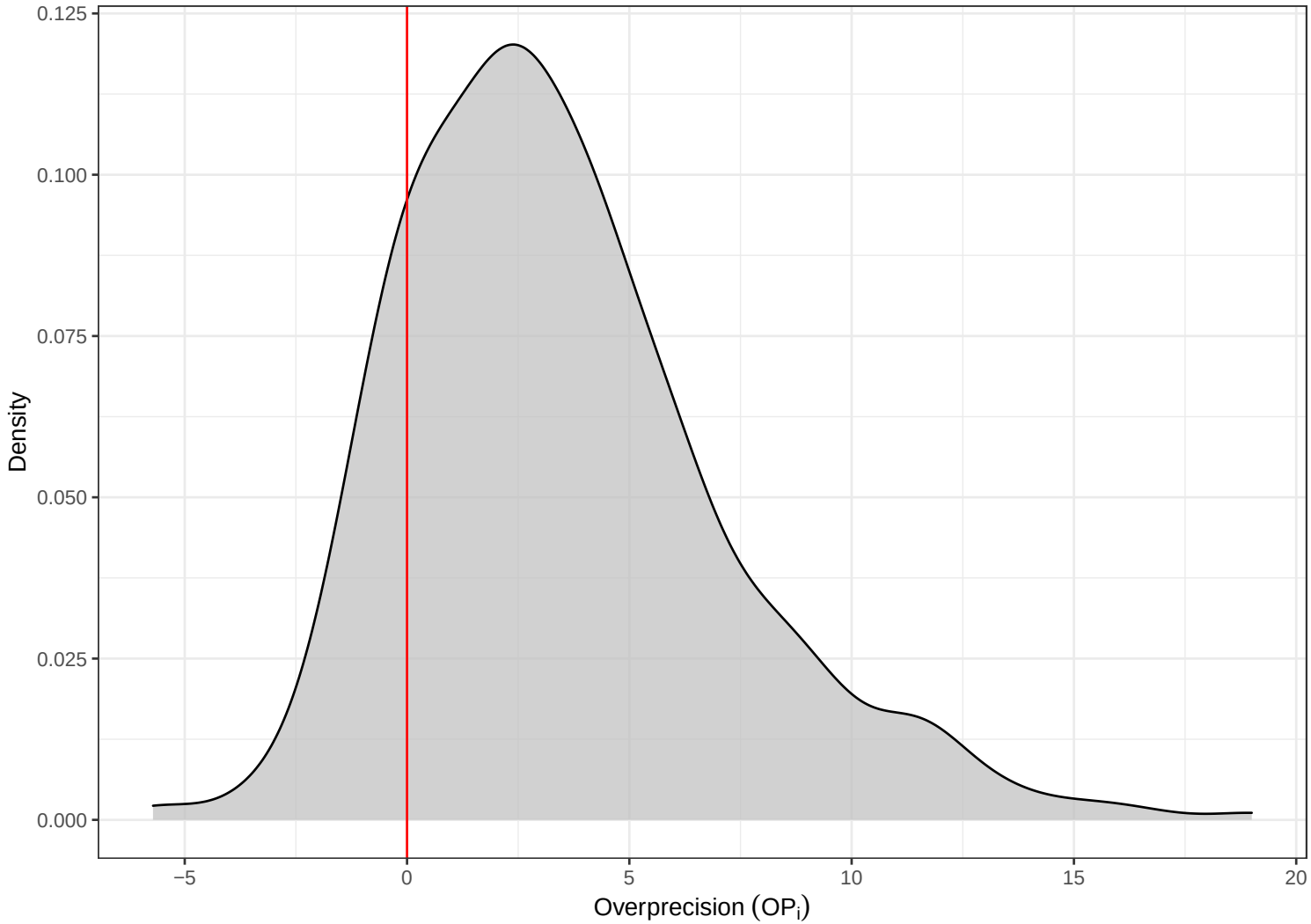
Aggregated Measure

However, subjects could decide not to answer questions

- 50% of the subjects answered all questions with 5% answering only one.
- Of those subjects that are perfectly calibrated 43% answered only one question and only 6% answered all seven.

Densities of Means



(b) Subset (N=410)

Overprecision by Answered

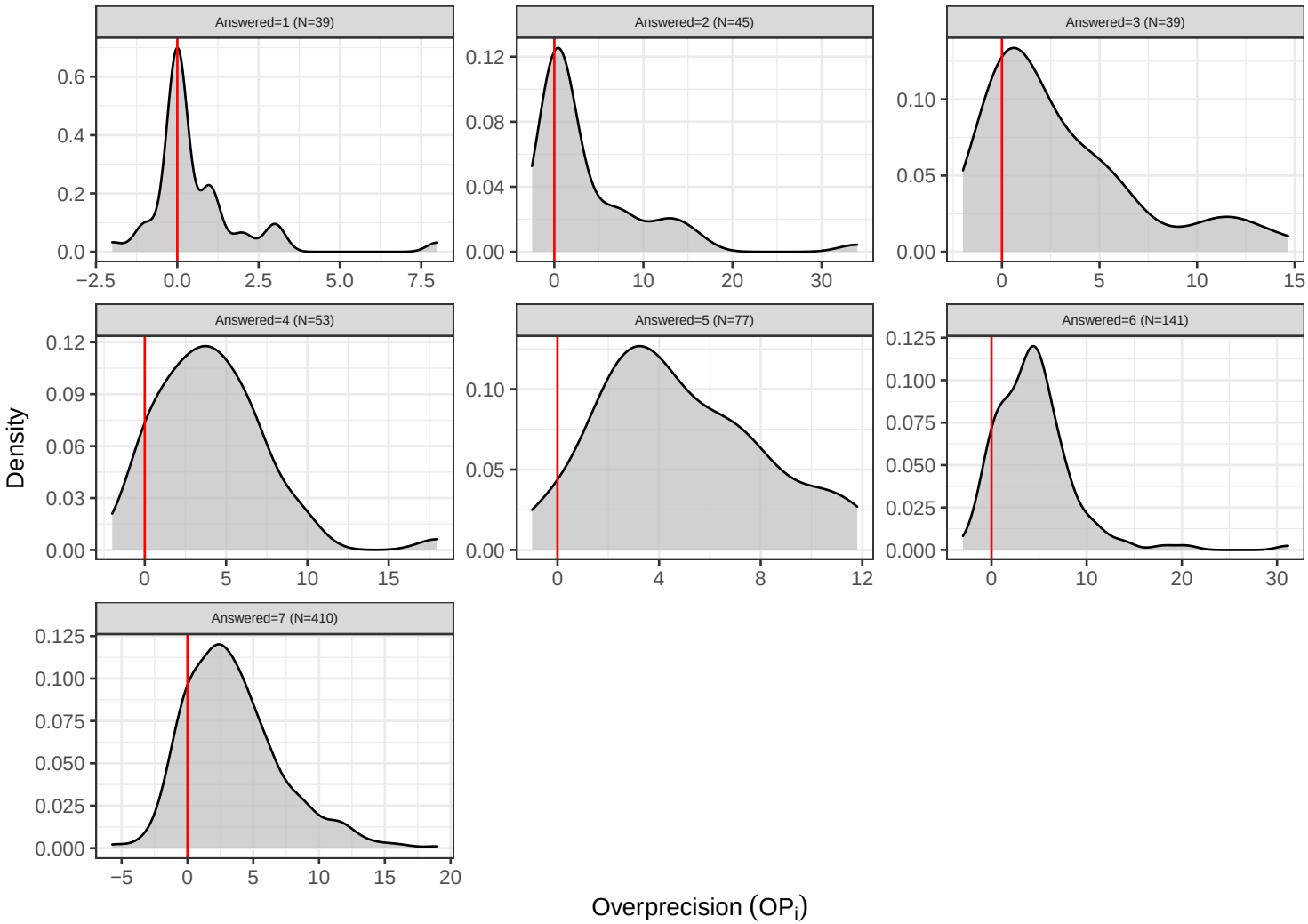


Figure: Overprecision by number of answered questions. Back

Oveprecision by Age and Question

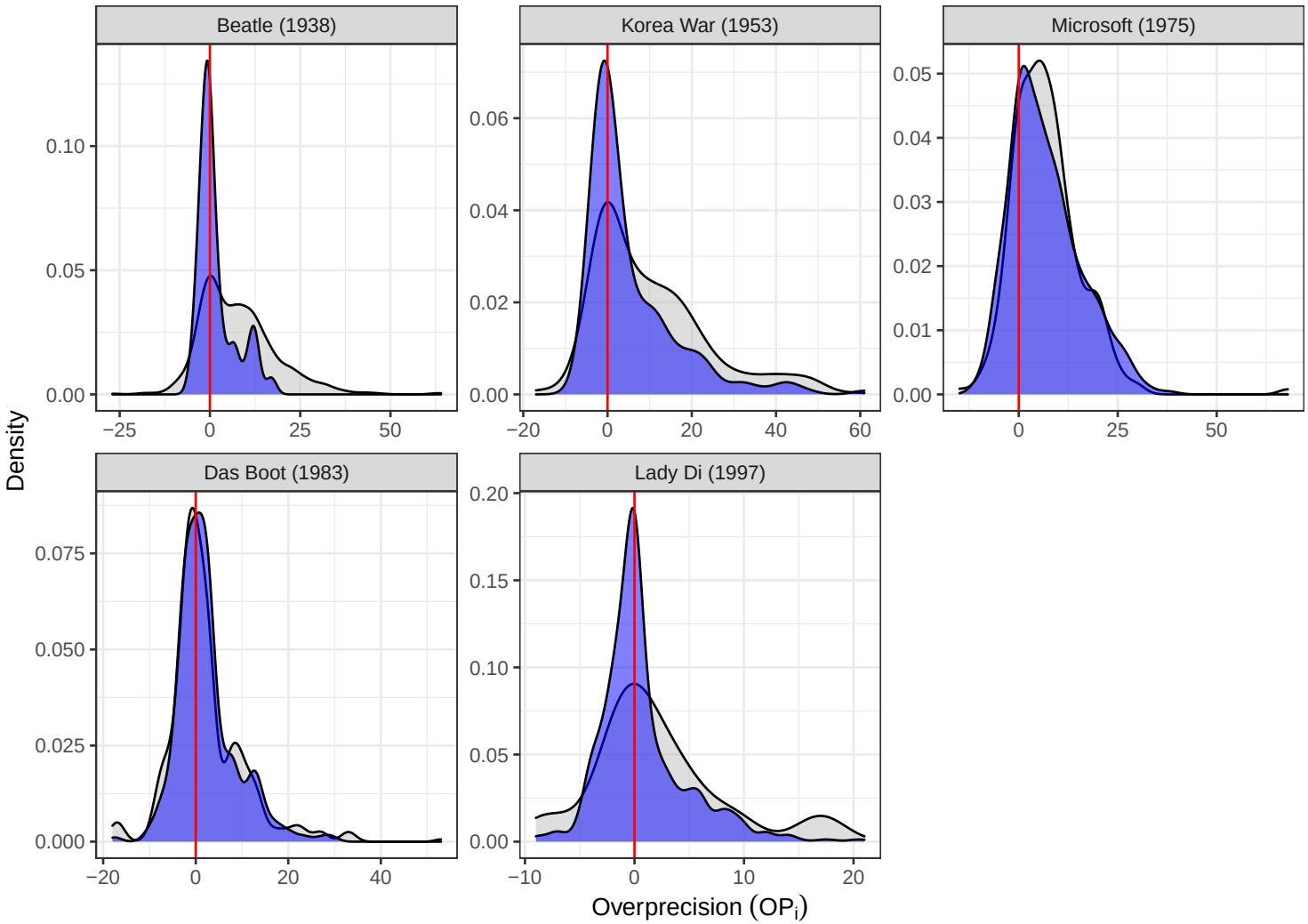


Figure: Density of Overprecision (OP_{ij}) for each question j. Back

Robustness Checks

	Baseline (1)	Residual (2)	Relative (3)	Standardized (4)	Age robust (5)
Age	-0.007**	0.006**	0.002	-0.002	0.018***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Female	0.082	-0.204***	0.056	0.067	0.023
	(0.072)	(0.071)	(0.080)	(0.073)	(0.071)
Years Education	-0.044***	-0.002	-0.015	-0.020	-0.015
	(0.014)	(0.014)	(0.016)	(0.014)	(0.014)
Answered	0.070***	-0.107***	0.016	-0.042**	0.065***
	(0.021)	(0.020)	(0.026)	(0.021)	(0.021)
Gross Income	-0.051**	0.002	-0.035	-0.051**	-0.041*
	(0.023)	(0.023)	(0.025)	(0.023)	(0.023)
Constant	0.502	0.361	0.085	0.822**	-0.620*
	(0.377)	(0.370)	(0.426)	(0.381)	(0.371)
N	805	805	702	805	801
adj. R^2	0.083	0.117	0.028	0.060	0.123
Fixed Effects	Yes	Yes	Yes	Yes	Yes
Employment Status	Yes	Yes	Yes	Yes	Yes

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

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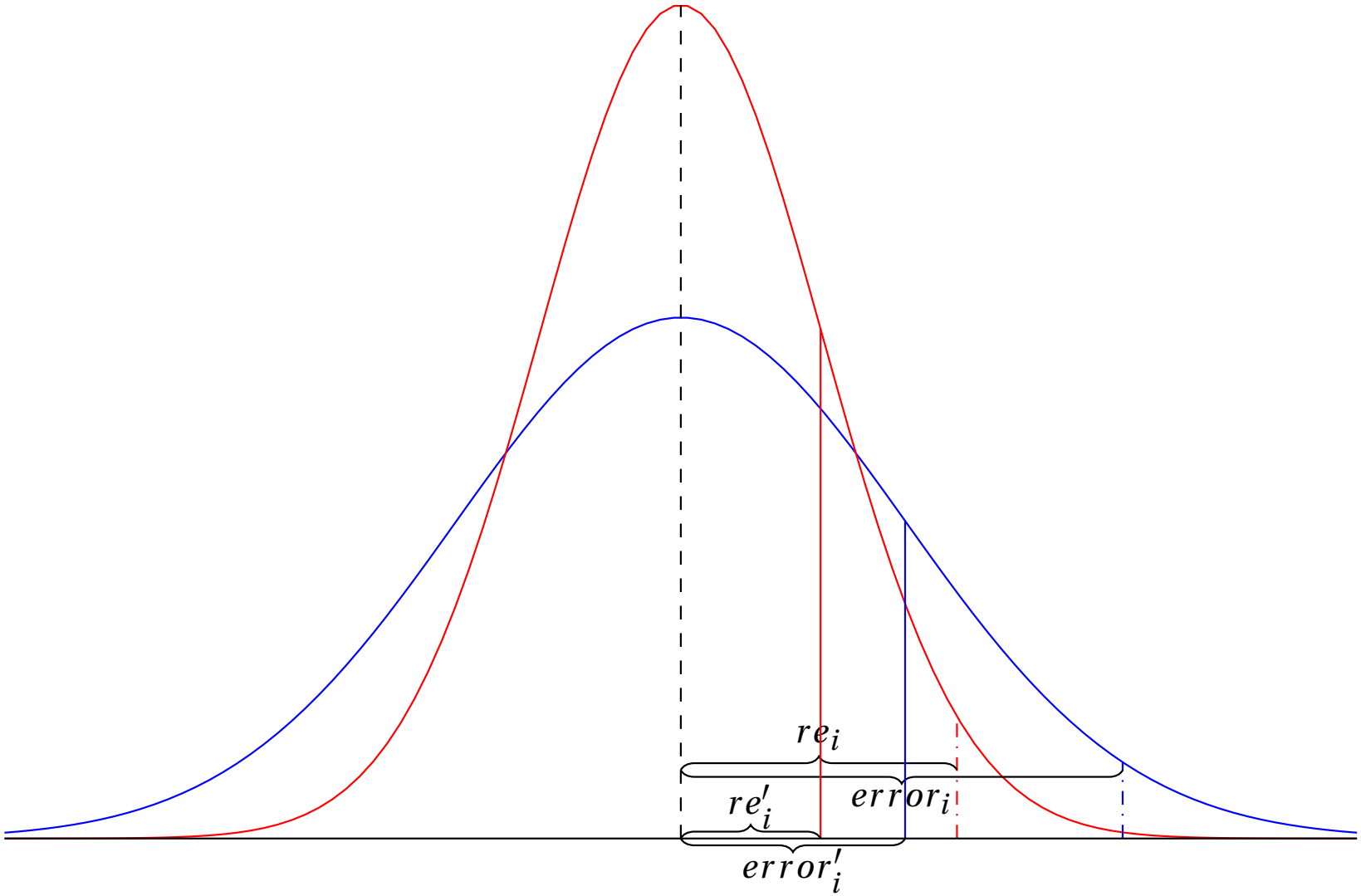
Relative Measure



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