Unexpectedly Broke: Expectations Errors and Credit Cycles

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1. **Motivation**
2. Data
3. Empirical analysis
4. Overoptimism?
5. Conclusion

Does overoptimism induce people to go into debt?

Relevance

- Private credit rises before financial crises
- Financial crises have great social costs

Problem

- Causes of credit booms unknown
- Expectations difficult to measure

Contribution

- Compile new cross-country expectation dataset
- Provide evidence for comovement in expectation errors and credit cycles

Definitions

Two definitions:*

- Overoptimism: Overestimate positive outcomes
- Overprecision: Underestimate variance

(Equivalent for overpessimism and underprecision)

* Malmendier and Taylor (2015)

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A new database of macroeconomic expectations

- Survey sent to banks and research institutes
- Macroeconomic forecasts
  - real GDP forecasts (12 months ahead)
- Since 1989, monthly
- 2.6 million forecasts
- Convert *fixed event* to *fixed horizon* forecasts*

Table 1: Data summary

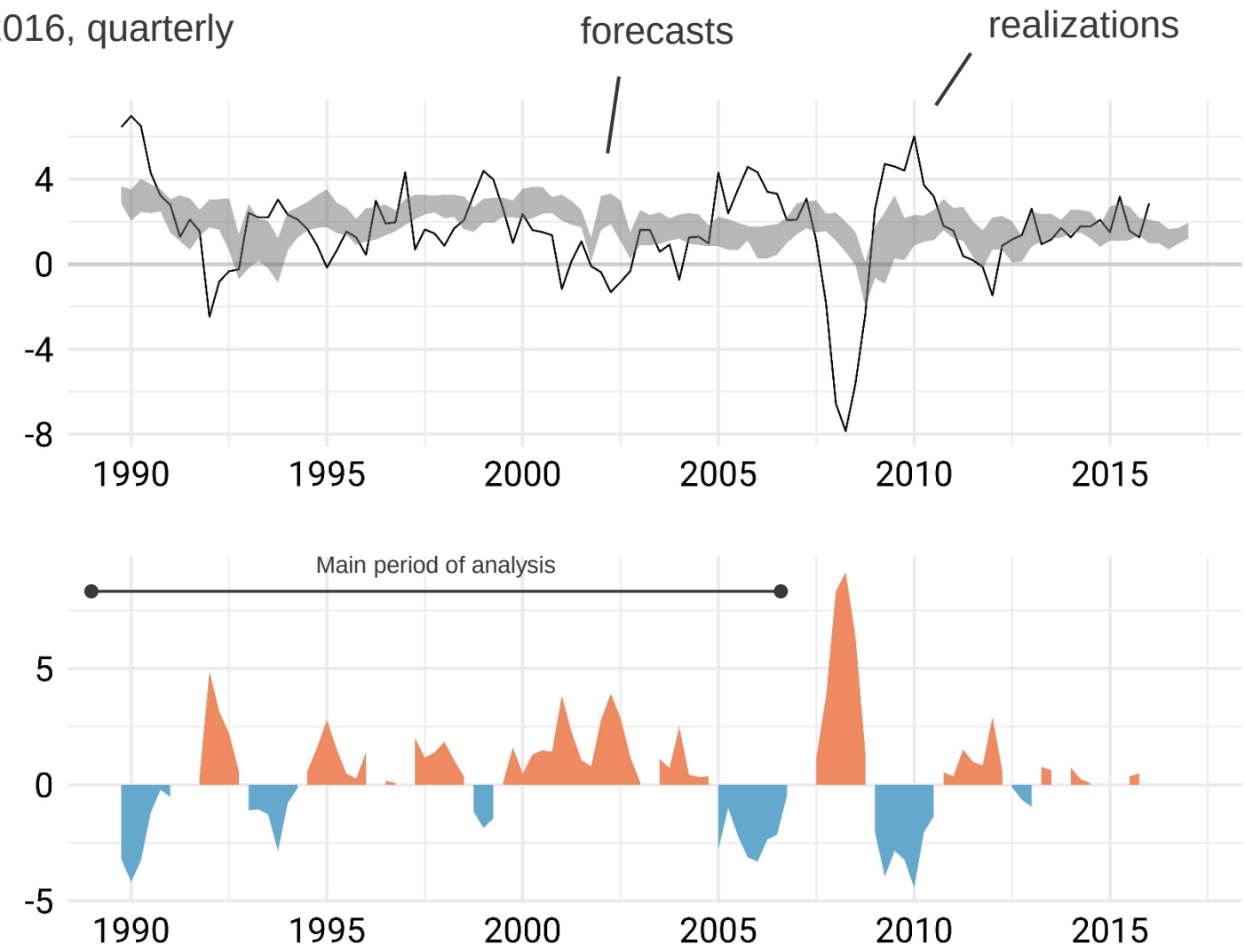
Number countries	32
(of which developing countries)[1]	(47%)
Coverage starting in 1980s	7
Coverage starting in 1990s	20
Coverage starting in 2000s	5
Share world GDP, PPP (2015)	79%
Nr. forecasts by country-month	17 (±5)

[1]: according to IMF

* Knüppel and Vladu (2017); Dovern, Fritsche and Slacalek (2012)

Example: Germany

1989-2016, quarterly



Source: CEF, own calculations

Macroeconomic/financial data

- Bank of International Settlements (BIS):
  - Household debt including non-profit organizations serving households
  - Non-financial firm debt
- Quarterly macro data: OECD, national statistical offices, central banks
- Interest rates: International Financial Statistics (IMF)

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Is overoptimism affecting credit growth?

forecast errors

$$c_{i,t} = \gamma_i + \delta_t + f_{i,t}\beta_1 + X'_{i,t}\beta_2 + \varepsilon_{i,t}$$

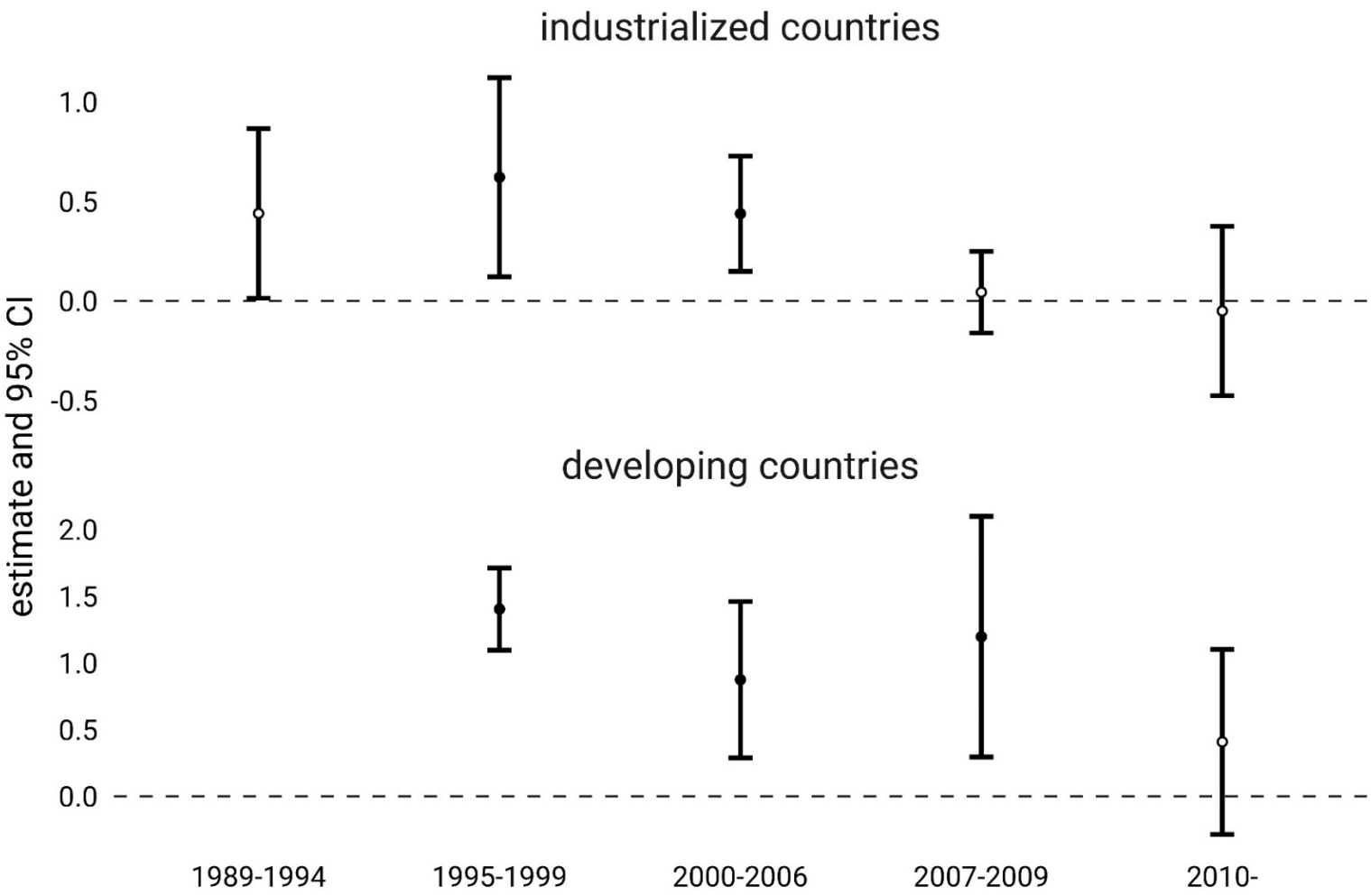
credit growth

fixed effects

controls

- $X_{i,t}$: controls (real GDP growth, expected inflation, interest rates, uncertainty/dispersion, Laeven-Valencia banking crises dummies)

Robust evidence for comovement



Estimation results from panel regressions. Dependent variable: House hold debt growth. Only shows estimate on forecast errors. Covariates: Real GDP growth, inflation, interest rates, dispersion (uncertainty) and LV banking crisis dummies.

Source: CEF, own calculations

Baseline regressions

	Dependent variable: $hhd_{i,t}$ (household debt growth)					
	(1)	(2)	(3)	(4)	(5)	(6)
Forecast errors	0.91**	0.70**	0.71**	0.72**	0.73**	0.70**
	(0.36)	(0.32)	(0.33)	(0.34)	(0.35)	(0.33)
Real GDP gr.		1.22***	1.35***	1.29***	1.37***	1.38***
		(0.31)	(0.31)	(0.30)	(0.34)	(0.35)
Exp. inflation			0.61***	0.89***	0.89***	0.91***
			(0.20)	(0.27)	(0.26)	(0.25)
Interest rate				-0.24	-0.26	-0.27
				(0.22)	(0.21)	(0.21)
Uncertainty					2.42	2.28
					(2.49)	(2.38)
Banking crises						2.28
						(4.41)
Observations	2348	2301	2301	2295	2295	2295
R^2	0.18	0.24	0.26	0.26	0.26	0.26

Note: All models include country and time fixed effects. Robust standard errors in parentheses. GDP: real GDP y-o-y growth. Exp. inflation: 12-month ahead expected CPI growth. Exp. inflation: 12-month ahead expected CPI growth. Uncertainty: Standard deviation of forecasts. Banking crises are defined by Laeven and Valencia (2012).*** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Taking stock

- Households go into debt when panellists' forecasts are too optimistic.
- Holds:
  - when controlling for several covariates,
  - when considering
    - subperiods, and
    - subsamples: industrialized and developing countries
- No significant relationship with firm debt
  - Mian, Sufi and Verner (2017b): Household credit tends to rise before recessions, but firm debt does not.

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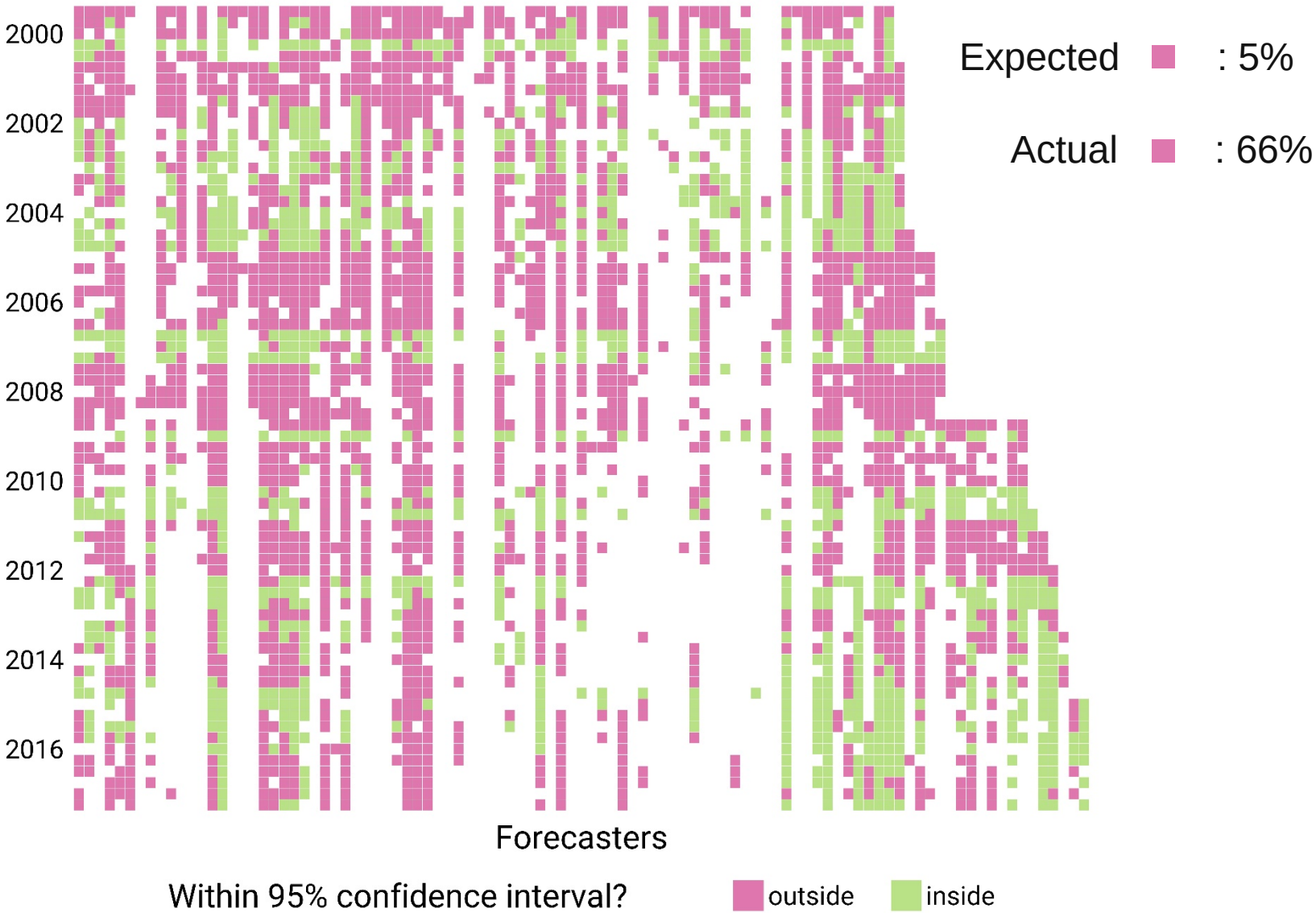
Overoptimism in the euro area

- No data on individual uncertainty in CEF
- But in ECB‘s *Survey of Professional Forecasters*
  - euro area, 1999-2016

Overconfidence of forecasters for euro area GDP



Source: ECB SPF, own calculations

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Conclusion

- Evidence for comovement in expectation errors and credit cycles:
- Overoptimistic forecasts robustly associated with increases in household debt
- Overprecision in euro area;
- Suggests role for biased income expectations in household saving decisions

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APPENDIX

Related empirical literature

Macrodata:

- *Credit cycles* (Mian, Sufi and Verner 2017b)

Microdata evidence for biased income expectations:

- *Households* (Roszypal and Schlafmann 2017; Stefani 2017)
- *Managers* (Gennaioli, Ma and Shleifer 2016)

CEF data:

- *Uncertainty* (Dovern, Fritsche and Slacalek 2012)
- *Herding* (Rülke et al. 2016)

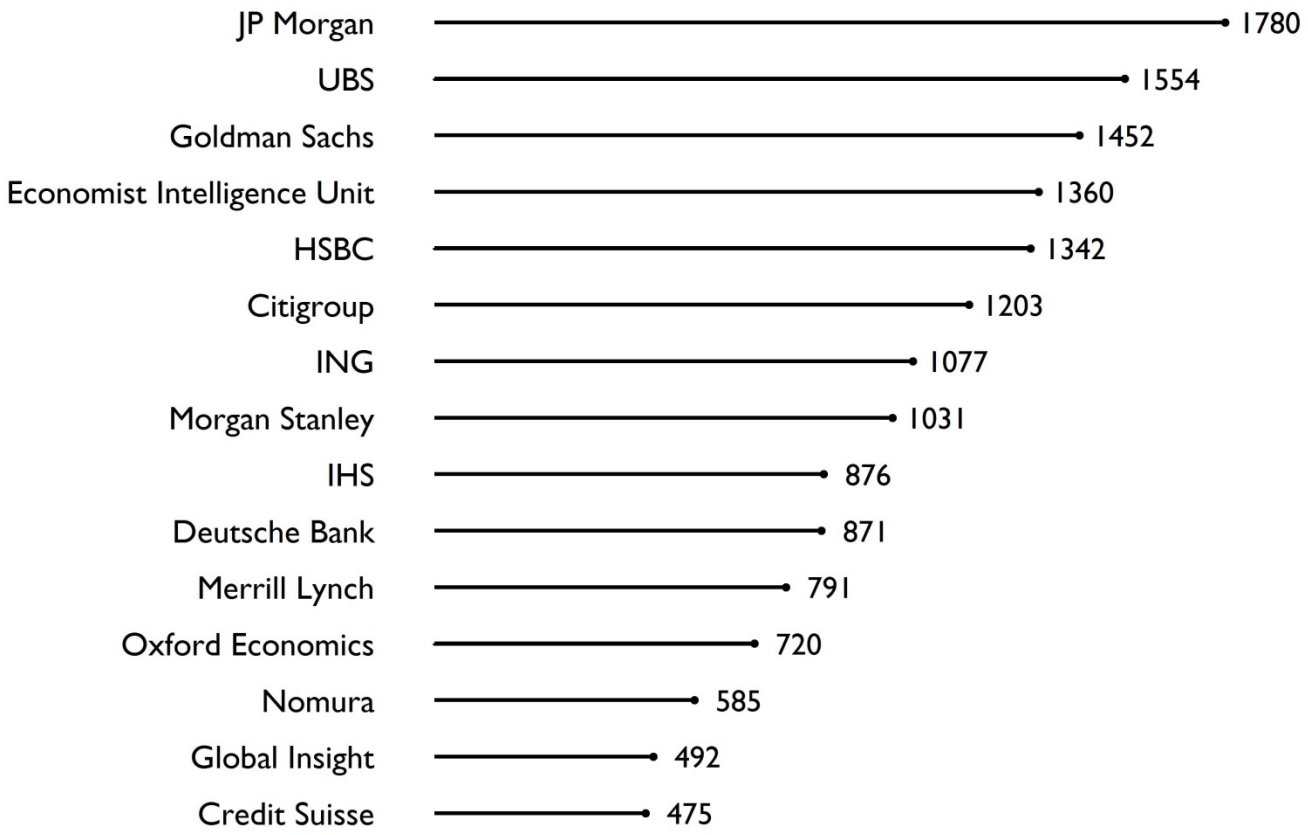
Theories of credit booms

Cochrane (2017): Unifying theme in macrofinance, a cyclical “wedge“ in the Euler Equation.

Different behavioral explanations: habits, extrapolative expectations (Bordalo, Gennaioli and Shleifer 2017), ...

Panelists

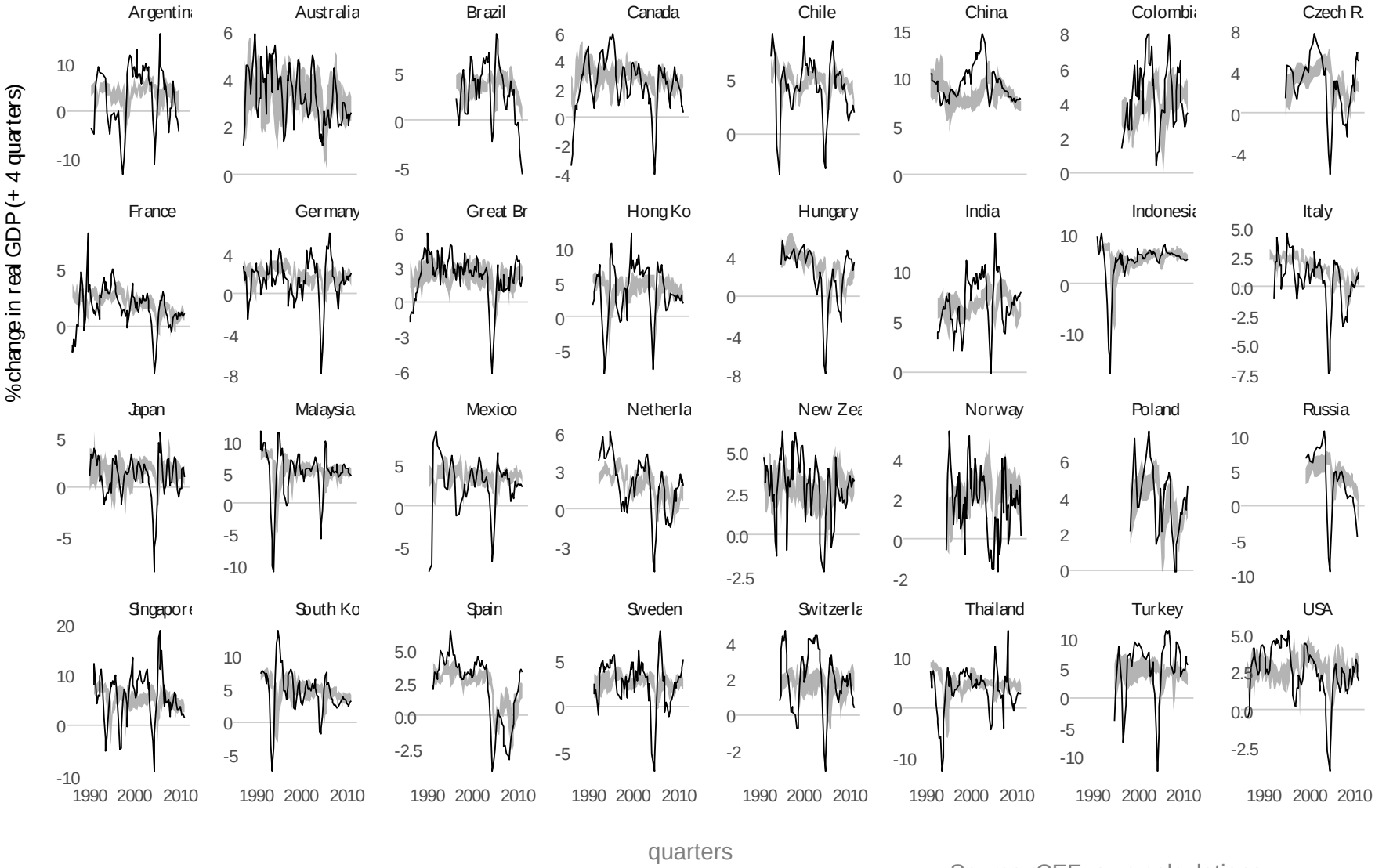
1989-2017, quarterly for 32 countries



Note: The other 727 panelists provide another 31,155 forecasts (mean: 42.9, median: 25).

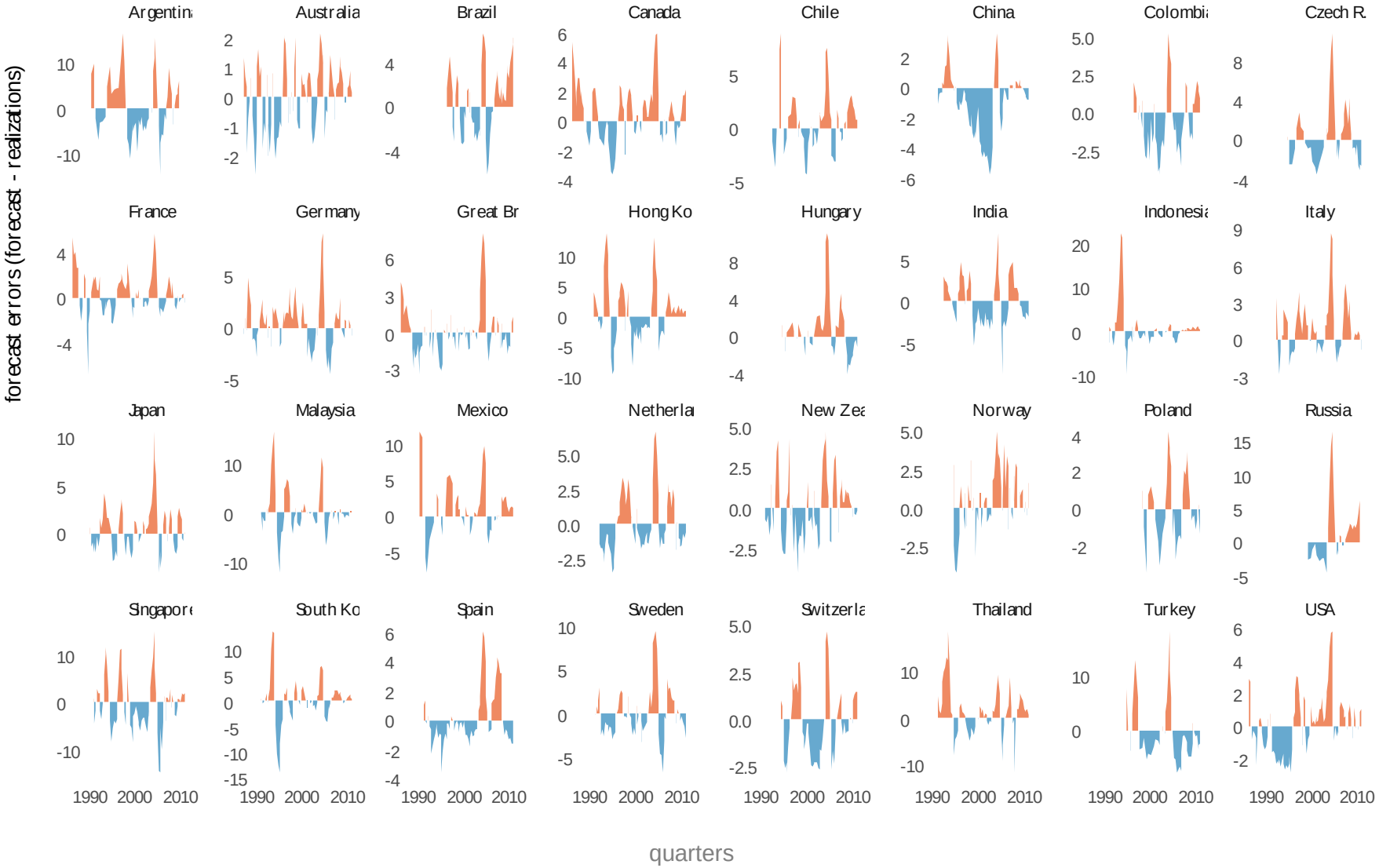
Source: CEF, own calculations

Forecasts and realizations



Source: CEF, own calculations

Forecast errors



Source: CEF, own calculations

Regressions by time period

	Dependent variable: $hhd_{i,t}$ (household debt growth)							
	no crisis		2007-2009		-2006		2010-	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Forecast errors	1.12**	0.94**	0.64*	0.13	1.21***	0.93**	0.16	0.077
	(0.45)	(0.41)	(0.35)	(0.55)	(0.41)	(0.37)	(0.26)	(0.26)
Observations	1969	1916	379	379	1188	1144	781	772
R^2	0.18	0.25	0.25	0.32	0.15	0.23	0.12	0.21
Add. controls		✓		✓		✓		✓

Note: All models include country and time fixed effects. Robust standard errors in parentheses. Additional controls are real GDP y-o-y growth, expected inflation, interest rates and forecaster dispersion (uncertainty). *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Regressions by country group

	Dependent variable: $hhd_{i,t}$ (household debt growth)								
	Industrialized			Developing			-China		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Forecast errors	0.49**	0.24	0.58***	1.47**	1.26**	1.54**	0.89**	0.71*	0.93**
	(0.20)	(0.18)	(0.19)	(0.49)	(0.47)	(0.64)	(0.36)	(0.35)	(0.37)
Observations	1588	1567	901	760	728	243	2316	2263	1144
R^2	0.28	0.37	0.21	0.31	0.42	0.45	0.17	0.26	0.23
Countries	18	18	18	14	14	14	31	31	31
Add. controls		✓	✓		✓	✓		✓	✓
< 2007			✓			✓			✓

Note: All models include country and time fixed effects. Robust standard errors in parentheses. A minus indicates excluding countries. Additional controls are real GDP y-o-y growth, expected inflation, interest rates and forecaster dispersion (uncertainty). *** p<0.01, ** p<0.05, * p<0.1.

Regressions: Firm debt

	Dependent variable: $fd_{i,t}$ (firm debt growth)					
	(1)	(2)	(3)	(4)	(5)	(6)
Forecast errors	0.12	0.20	0.22	0.22	0.21	0.23
	(0.33)	(0.29)	(0.14)	(0.15)	(0.14)	(0.14)
Real GDP gr.		-0.13	0.17	0.18	0.13	0.13
		(0.43)	(0.36)	(0.34)	(0.33)	(0.34)
Exp. inflation			1.48**	1.42***	1.42***	1.41***
			(0.56)	(0.50)	(0.50)	(0.49)
Interest rate				0.057	0.068	0.072
				(0.13)	(0.13)	(0.13)
Uncertainty					-1.46	-1.38
					(1.66)	(1.67)
Banking crises						-1.24
						(1.52)
Observations	2330	2283	2283	2277	2277	2277
R^2	0.13	0.14	0.30	0.30	0.30	0.30

Robustness checks

Holds for

- Credit-to-GDP gaps (HP-filtered component)
- Different method to construct *fixed horizon* forecasts
- Altenative definitions of overoptimism

Overoptimism created by overreactions to good news?

Analyze revisions of forecasts*

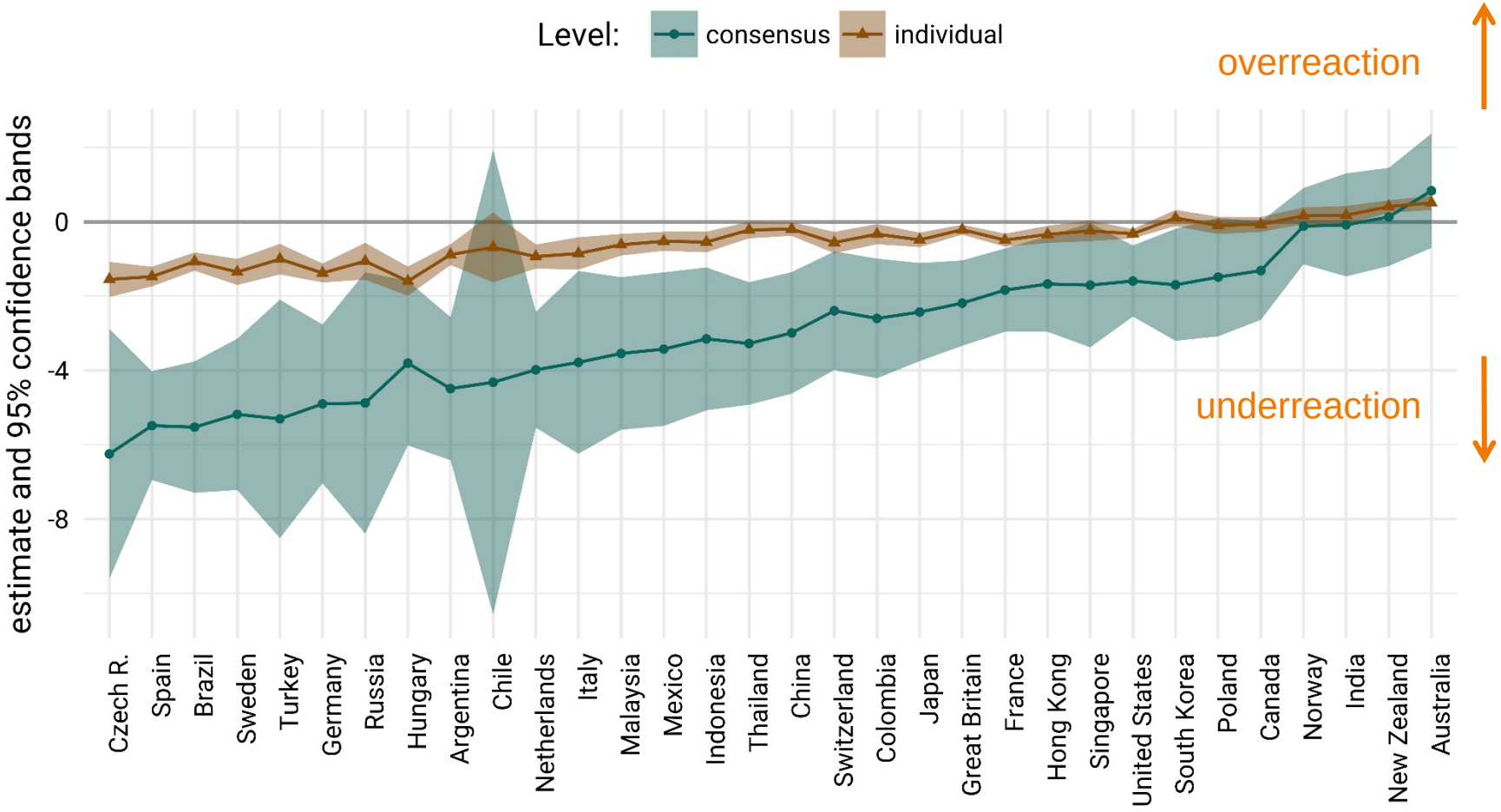
For individual panelists:

$$f_{i,k,t} = \mathrm{rev}_{i,k,t}\,\beta + u_{i,k,t}$$

- $f_{i,k,t}$: forecast error
- $\mathrm{rev}_{i,k,t}$: forecast revision relative to 3 months ago
- *i:* country, *k:* panelist
- Interpretation: ($\beta > 0$) overreaction; ($\beta < 0$) underreaction
- Also control for month of forecast and forecaster fixed effect

* Coibion and Gorodnichenko (2012); Bordalo, Gennaioli, Ma and Shleifer (2018)

Forecasters underreact to news



Estimates from regressing forecast errors on 3-month forecast revisions. "Consensus" is the mean across forecasts, "individual" uses data on the level of survey participants.

Source: CEF, own calculations