Trust the Experts? Eight Decades of Inflation Expectations

Tyler Goodspeed
Hoover Institution, Stanford University
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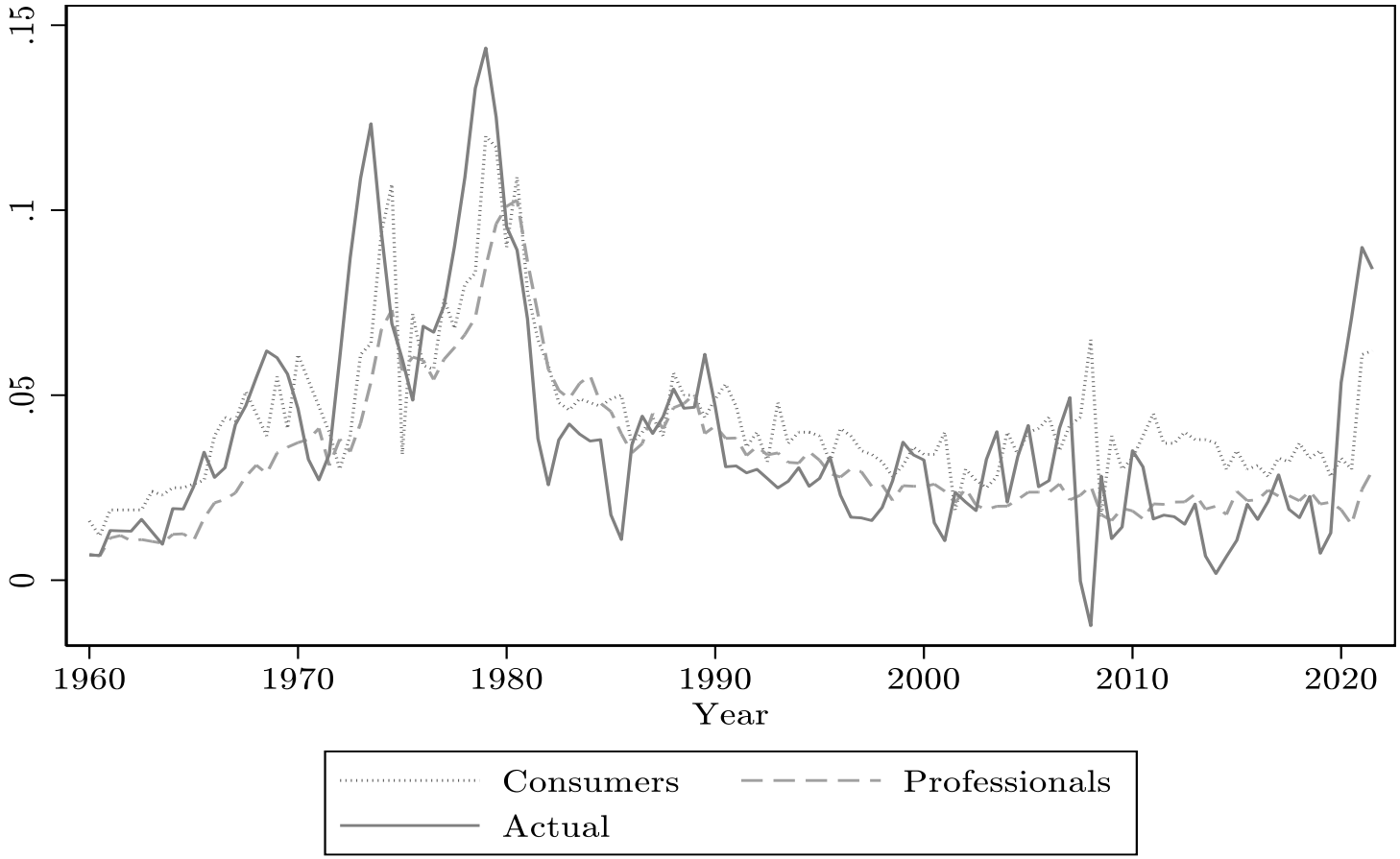
E: tbg@stanford.edu

Consumers versus professionals, 1960-2022



Sources: University of Michigan; Federal Reserve Bank of Philadelphia; Bureau of Labor Statistics; Author's calculations.

Preview of results

- During periods of low and stable inflation, the average professional forecaster is generally more accurate, rational, and efficient.
- But during periods of high inflation and inflation regime change, the average consumer forecast is more accurate, rational and efficient.
- 3.5% inflation is a critical threshold above which consumers rationally predict inflation.
- Professionals with commercial banks and labor organizations outperform other professionals during periods of price stability.
- Professionals with labor organizations exhibit less bias and more rationality and efficiency during periods of inflation regime change.

Survey data

- Livingston Survey of Professional Economists
  - Every June and December, 1946-present.
  - Implicit 14-month forecast, 1946-1991; 12-month forecast, 1992-present.
  - Seasonally unadjusted level of CPI, 1946-2004; seasonally adjusted level of CPI, 2004-present.

- University of Michigan Survey of Consumers
  - Quarterly, 1960-1977; monthly, 1978-present.
  - 1960 to 1966:Q2: "Do you think prices will go up in the next year, or go down, or stay the same?"
  - 1966:Q2 to 1977:Q3, respondents with $\pi^e > 0$ asked to report within specified ranges by how much they expected prices to increase.

Forecast bias by time period and survey

$$\pi_t - E_{t-12}\pi_t = \alpha_1 + \alpha_2 Survey + \varepsilon_t$$

	1960-2022
	(1)
α_1: Professionals	0.47
	(0.11)
$\alpha_1 + \alpha_2$: Consumers	-0.54**
	p = 0.04
α_2: Difference	-1.02***
	(0.11)
R^2	0.30
N	248

Forecast bias by time period and survey

$$\pi_t - E_{t-12}\pi_t = \alpha_1 + \alpha_2 Survey + \varepsilon_t$$

	1960-2022	*1960-1965*
	(1)	(2)
α_1: Professionals	0.47	0.50
	(0.11)	(0.26)
$\alpha_1 + \alpha_2$: Consumers	-0.54**	-0.52*
	p = 0.04	p = 0.05
α_2: Difference	-1.02***	-1.02***
	(0.11)	(0.14)
R^2	0.30	0.48
N	248	24

Forecast bias by time period and survey

$$\pi_t - E_{t-12}\pi_t = \alpha_1 + \alpha_2 Survey + \varepsilon_t$$

	1960-2022	*1960-1965*	*1966-1980*
	(1)	(2)	(3)
α_1: Professionals	0.47	0.50	2.15***
	(0.11)	(0.26)	(0.67)
$\alpha_1 + \alpha_2$: Consumers	-0.54**	-0.52*	0.92
	p = 0.04	p = 0.05	p = 0.16
α_2: Difference	-1.02***	-1.02***	-1.22***
	(0.11)	(0.14)	(0.24)
R^2	0.30	0.48	0.07
N	248	24	58

Forecast bias by time period and survey

$$\pi_t - E_{t-12}\pi_t = \alpha_1 + \alpha_2 Survey + \varepsilon_t$$

	1960-2022	*1960-1965*	*1966-1980*	*1980-1987*
	(1)	(2)	(3)	(4)
α_1: Professionals	0.47	0.50	2.15***	-1.48**
	(0.11)	(0.26)	(0.67)	(0.46)
$\alpha_1 + \alpha_2$: Consumers	-0.54**	-0.52*	0.92	-1.43**
	p = 0.04	p = 0.05	p = 0.16	p = 0.02
α_2: Difference	-1.02***	-1.02***	-1.22***	0.06
	(0.11)	(0.14)	(0.24)	(0.20)
R^2	0.30	0.48	0.07	0.00
N	248	24	58	28

Forecast bias by time period and survey

$$\pi_t - E_{t-12}\pi_t = \alpha_1 + \alpha_2 Survey + \varepsilon_t$$

	1960-2022	*1960-1965*	*1966-1980*	*1980-1987*	*1987-2020*
	(1)	(2)	(3)	(4)	(5)
α_1: Professionals	0.47	0.50	2.15***	-1.48**	-0.01
	(0.11)	(0.26)	(0.67)	(0.46)	(0.22)
$\alpha_1 + \alpha_2$: Consumers	-0.54**	-0.52*	0.92	-1.43**	-1.09***
	p = 0.04	p = 0.05	p = 0.16	p = 0.02	p = 0.00
α_2: Difference	-1.02***	-1.02***	-1.22***	0.06	-1.08***
	(0.11)	(0.14)	(0.24)	(0.20)	(0.11)
R^2	0.30	0.48	0.07	0.00	0.11
N	248	24	58	28	134

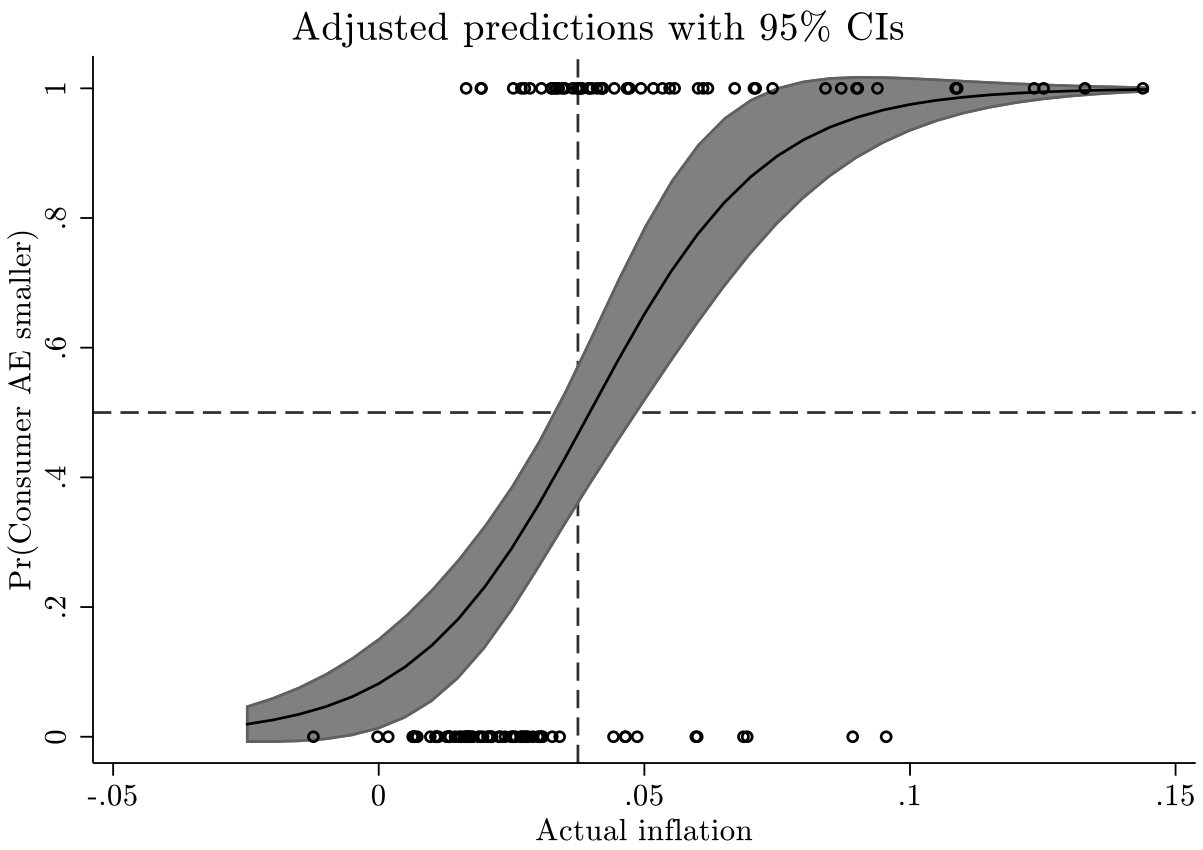
Forecast bias by time period and survey

$$\pi_t - E_{t-12}\pi_t = \alpha_1 + \alpha_2 Survey + \varepsilon_t$$

	1960-2022	*1960-1965*	*1966-1980*	*1980-1987*	*1987-2020*	*2021-2022*
	(1)	(2)	(3)	(4)	(5)	(6)
α_1: Professionals	0.47	0.50	2.15***	-1.48**	-0.01	5.99
	(0.11)	(0.26)	(0.67)	(0.46)	(0.22)	*N/A*
$\alpha_1 + \alpha_2$: Consumers	-0.54**	-0.52*	0.92	-1.43**	-1.09***	2.55
	p = 0.04	p = 0.05	p = 0.16	p = 0.02	p = 0.00	*N/A*
α_2: Difference	-1.02***	-1.02***	-1.22***	0.06	-1.08***	3.44
	(0.11)	(0.14)	(0.24)	(0.20)	(0.11)	*N/A*
R^2	0.30	0.48	0.07	0.00	0.11	0.93
N	248	24	58	28	134	4

Predicted probability consumer $AE <$ professional AE by inflation level

$$P(Y = 1 \mid \pi_t) = F(\alpha + \beta\pi_t)$$



Are forecasts biased when $\pi <= 3.5\%$, $\pi > 3.5\%$?

$$\pi_t - E_{t-12}\pi_t = \alpha_1 + \alpha_2 Survey + \alpha_3 \Pi_t^{3.5} + \alpha_4 Survey \cdot \Pi_t^{3.5} + \varepsilon_t$$

	Panel A: $\Pi_t^{3.5} = 0$ ($\pi <= 3.5\%$)		*Panel B:* $\Pi_t^{3.5} = 1$ ($\pi > 3.5\%$)	
	(1)	(2)	(3)	(4)
Consumers	$\alpha_1+\alpha_2$:	-1.47%***	$\alpha_1+\alpha_2+\alpha_3+\alpha_4$:	0.61%
		(0.00)		(0.12)
Professionals	α_1:	-0.36%**	$\alpha_1+\alpha_3$:	1.37%**
		(0.03)		(0.01)
Smaller Mean Error?	Professionals***		Consumers***	
	(0.00)		(0.00)	
R^2	0.30			
N	146		102	

Notes: p-values are reported in parentheses. Robust standard errors (not reported) are clustered at the overlapping forecast-pair level. *** p < 0.01, ** p < 0.05, * p < 0.10.

Are forecast errors autocorrelated?

$$\pi_t - E_{t-12}\pi_t = \alpha_1 + \alpha_2 \Pi_t^{3.5} + \beta(\pi_{t-12} - E_{t-24}\pi_{t-12}) + \gamma(\pi_{t-12} - E_{t-24}\pi_{t-12}) \cdot \Pi_t^{3.5} + \varepsilon_t$$

	Consumers	*Professionals*
	(1)	(2)
β: $(\pi_{t-12} - E_{t-24}\pi_t)$	-0.02	0.12
	(0.19)	(0.24)
α_1: Constant	-1.81%***	-0.53%**
	(0.45)	(0.21)
$\alpha_1 = \beta = 0$?	NO***	NO**
	p = 0.00	p = 0.01
γ: $(\pi_{t-12} - E_{t-24}\pi_t) \cdot \Pi_t^{3.5}$	0.20	0.23
	(0.25)	(0.31)
$\alpha_1 + \alpha_2$: Constant	0.61%	1.10%***
	p = 0.23	p = 0.00
$\beta + \gamma = 0$?	YES	NO*
	p = 0.27	p = 0.09
$\alpha_1 + \alpha_2 = \beta + \gamma = 0$?	YES	NO***
	p = 0.11	p = 0.00
R^2	0.42	0.35
N	59	59

Notes: Robust standard errors are reported in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.10

Does actual inflation on average move one-for-one with the forecast?

$\pi_t = \alpha_1 + \alpha_2 \Pi_t^{3.5} + \beta E_{t-12}\pi_t + \gamma E_{t-12}\pi_t \cdot \Pi_t^{3.5} + \varepsilon_t$		
	Consumers	*Professionals*
	(1)	(2)
β: $E_{t-12}\pi_t$	0.07	0.37***
	(0.23)	(0.13)
α_1: Constant	1.79%**	1.14%***
	(0.76)	(0.33)
$\alpha_1 = 0, \beta = 1$?	NO***	NO***
	$p = 0.00$	$p = 0.00$
γ: $E_{t-12}\pi_t \cdot \Pi_t^{3.5}$	0.83**	0.46*
	(0.30)	(0.26)
$\alpha_1 + \alpha_2$: Constant	1.18%	2.21%**
	$p = 0.23$	$p = 0.03$
$\beta + \gamma = 1$?	YES	YES
	$p = 0.59$	$p = 0.47$
$\alpha_1 + \alpha_2 = 0, \beta + \gamma = 1$?	YES	NO***
	$p = 0.15$	$p = 0.00$
R^2	0.75	0.70
N	120	120

Notes: Robust standard errors are clustered at the overlapping forecast-pair level and reported in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.10.

Just for the Grumpy Economist

$$\pi_t - \pi_{t-12} = \alpha_1 + \alpha_2 \Pi_t^{3.5} + \beta_1 (E[\text{Michigan}]_{t-12}\pi_t - \pi_{t-12}) + \beta_2 (E[\text{Livingston}]_{t-12}\pi_t - \pi_{t-12}) + \gamma_1 (E[\text{Michigan}]_{t-12}\pi_t - \pi_{t-12}) \cdot \Pi_t^{3.5} + \gamma_2 (E[\text{Livingston}]_{t-12}\pi_t - \pi_{t-12}) \cdot \Pi_t^{3.5} + \varepsilon_t$$

	Consumers	*Professionals*
	(1)	(2)
α_1: Constant	-0.17%	
	(0.37)	
$\alpha_1 + \alpha_2$: Constant	0.61%**	
	$p = 0.02$	
β_1: $(E[\text{Michigan}]_{t-12}\pi_t - \pi_{t-12})$	-0.18	
	(0.29)	
β_2: $(E[\text{Livingston}]_{t-12}\pi_t - \pi_{t-12})$		1.19***
		(0.28)
γ_1: $(E[\text{Michigan}]_{t-12}\pi_t - \pi_{t-12}) \cdot \Pi_t^{3.5}$	1.28***	
	(0.35)	
γ_2: $(E[\text{Livingston}]_{t-12}\pi_t - \pi_{t-12}) \cdot \Pi_t^{3.5}$		-1.40***
		(0.33)
$\beta_1 = 1$?	NO***	
	$p = 0.00$	
$\beta_2 = 1$?		YES
		$p = 0.48$
$\beta_1 + \gamma_1 = 1$?	YES	
	$p = 0.61$	
$\beta_2 + \gamma_2 = 1$?		NO***
		$p = 0.00$
R^2	0.50	
N	122	

Notes: Robust standard errors are reported in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.10.

Is information fully exploited?

$\pi_t - E_{t-12}\pi_t = \alpha_1 + \alpha_2 \Pi_t^{3.5} + \beta E_{t-12}\pi_t + \gamma E_{t-12}\pi_t \cdot \Pi_t^{3.5} + \varepsilon_t$		
	Consumers	*Professionals*
	(1)	(2)
β: $E_{t-12}\pi_t$	-0.93***	-0.63***
	(0.19)	(0.13)
α_1: Constant	1.79%**	1.14%***
	(0.64)	(0.33)
$\alpha_1 = \beta = 0$?	NO***	NO***
	$p = 0.00$	$p = 0.00$
γ: $E_{t-12}\pi_t \cdot \Pi_t^{3.5}$	0.83***	-0.46
	(0.11)	(0.26)
$\alpha_1 + \alpha_2$: Constant	1.18%	2.21%***
	$p = 0.23$	$p = 0.03$
$\beta + \gamma = 0$?	YES	YES
	$p = 0.59$	$p = 0.47$
$\alpha_1 + \alpha_2 = \beta + \gamma = 0$?	YES	NO***
	$p = 0.15$	$p = 0.00$
R^2	0.44	0.28
N	120	120

Notes: Robust standard errors are clustered at the overlapping forecast-pair level and reported in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.10.

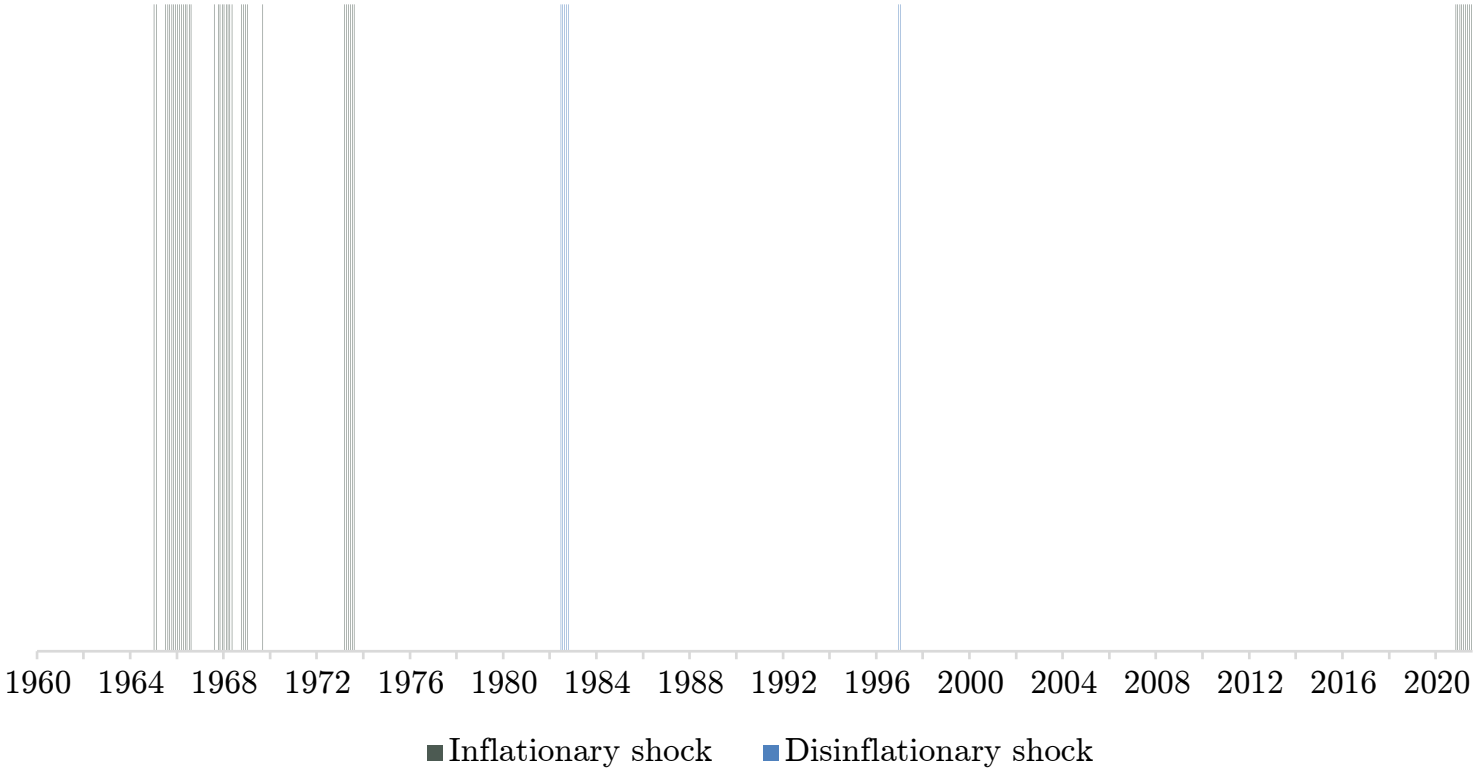
Is macroeconomic data fully exploited?

$$\pi_t - E_{t-12}\pi_t = \alpha_1 + \beta E_{t-12}\pi_t + \varphi \pi_{t-14} + \kappa i_{t-13} + \delta U_{t-13} + \alpha_2 \Pi_t^{3.5} + \gamma E_{t-12}\pi_t \cdot \Pi_t^{3.5} + \lambda \pi_{t-14} \cdot \Pi_t^{3.5} + \varepsilon_t$$

	Consumers	*Professionals*
	(1)	(2)
$\varphi: \pi_{t-14}$	0.40***	0.13
	(0.11)	(0.16)
$\kappa: i_{t-14}$	-0.00	-0.00*
	(0.00)	(0.00)
$\delta: U_{t-14}$	-0.00**	-0.00***
	(0.00)	(0.00)
$\varphi = \kappa = \delta = 0$?	NO***	NO*
	$p = 0.00$	$p = 0.05$
$\lambda: \pi_{t-14} \cdot \Pi_t^{3.5}$	-0.29	0.04
	(0.20)	(0.29)
$\alpha_1 + \alpha_2 = \beta + \gamma = 0$?	NO*	NO***
	$p = 0.08$	$p = 0.00$
$\varphi + \lambda = \kappa = \delta = 0$?	YES	NO***
	$p = 0.23$	$p = 0.01$
R^2	0.49	0.40
N	120	120

Notes: Robust standard errors are clustered at the overlapping forecast-pair level and reported in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.10.

Identifying inflationary regime shifts



$$\Pi_t^{inf} = 1 \text{ if } \bar{\pi}_{[t+1,\, t+60]} > \bar{\pi}_{[t-1,\, t-60]} + 2\sigma_{[t-1,\, t-60]} \text{ and } \pi_t > \bar{\pi}_{[t-1,\, t-60]} + 2\sigma_{[t-1,\, t-60]}$$
$$= 0 \text{ otherwise}$$
$$\Pi_t^{dis} = 1 \text{ if } \bar{\pi}_{[t+1,\, t+60]} < \bar{\pi}_{[t-1,\, t-60]} - 2\sigma_{[t-1,\, t-60]} \text{ and } \pi_t < \bar{\pi}_{[t-1,\, t-60]} - 2\sigma_{[t-1,\, t-60]}$$
$$= 0 \text{ otherwise}$$

Are forecasts biased during inflation regime shifts?

$\pi_t - E_{t-12}\pi_t = \alpha_1 + \alpha_2 \Pi_t^{inf} + \alpha_3 \Pi_t^{dis} + \beta\, Survey + \gamma_1 Survey \cdot \Pi_t^{inf} + \gamma_2 Survey \cdot \Pi_t^{dis} + \varepsilon_t$

	Consumers	*Professionals*	*Difference?*
	(1)	(2)	(3)
α_1 (Professionals), $\alpha_1 + \beta$ (Consumers)	-0.69%***	0.25%	YES***
	p = 0.01	p = 0.44	p = 0.00
α_2	2.13%**		
	(0.85)		
α_3	-1.55%***		
	(0.27)		
γ_1	-0.64%***		
	(0.22)		
γ_2	0.82%**		
	(0.33)		
$\Pi_t^{inf} = 1, \Pi_t^{dis} = 0$	0.80%	2.38%***	YES***
	p = 0.41	p = 0.01	p = 0.00
$\Pi_t^{inf} = 0, \Pi_t^{dis} = 1$	-1.41%***	-1.29%***	NO
	p = 0.00	p = 0.00	p = 0.72
R^2		0.12	
N		228	

Notes: Robust standard errors are clustered at the overlapping forecast-pair level and reported in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.10.

Are forecasts rational and efficient during regime shifts?

	Consumers	*Professionals*
A. Are forecasting errors uncorrelated?		
No shock	NO***	YES
Inflationary shock	NO***	NO***
Disinflationary shock	YES	NO***
B. Is information in the forecast fully exploited?		
No shock	NO***	YES
Inflationary shock	YES	NO***
Disinflationary shock	NO***	NO***
C. Does inflation, on average, move one-for-one with the forecast?		
No shock	NO***	YES
Inflationary shock	YES	NO***
Disinflationary shock	NO***	NO***
D. Are available macroeconomic data fully exploited?		
No shock	NO***	NO**
Inflationary shock	NO***	NO*
Disinflationary shock	NO***	NO***

Forecast bias by regime shock and type of expert

$$\pi_t - E_{t-12}\pi_t = \alpha_1 + \alpha_2 \Pi_t^{inf} + \alpha_3 \Pi_t^{dis} + \beta\, Survey + \gamma_1 Survey \cdot \Pi_t^{inf} + \gamma_2 Survey \cdot \Pi_t^{dis} + \varepsilon_t$$

	$\Pi_t^{inf}, \Pi_t^{dis} = 0$	$\Pi_t^{inf} = 1, \Pi_t^{dis} = 0$	$\Pi_t^{inf} = 0, \Pi_t^{dis} = 1$
	$(\alpha_1 + \beta)$	$(\alpha_1 + \alpha_2 + \beta + \gamma_1)$	$(\alpha_1 + \alpha_3 + \beta + \gamma_2)$
	(1)	(2)	(3)
Academic	0.43*	2.30**	-1.33***
	(0.06)	(0.02)	(0.00)
Commercial banking	0.35	2.22***	-1.41***
	(0.15)	(0.01)	(0.00)
Federal Reserve	0.92	2.79***	-0.84***
	(0.18)	(0.00)	(0.00)
Government	0.51**	2.38**	-1.25***
	(0.04)	(0.04)	(0.00)
Investment banking	0.28	2.15***	-1.48***
	(0.26)	(0.00)	(0.00)
Labor	0.19	2.06***	-1.57***
	(0.58)	(0.01)	(0.00)
Nonfinancial business	0.30	2.17**	-1.46***
	(0.20)	(0.01)	(0.00)
Other	0.51	2.38***	-1.25***
	(0.15)	(0.01)	(0.00)

Notes: p-values are reported in parentheses. Robust standard errors (not reported) are clustered at the overlapping forecast-pair level. Estimates are reported in percentages.
*** p < 0.01, ** p < 0.05, * p < 0.10.

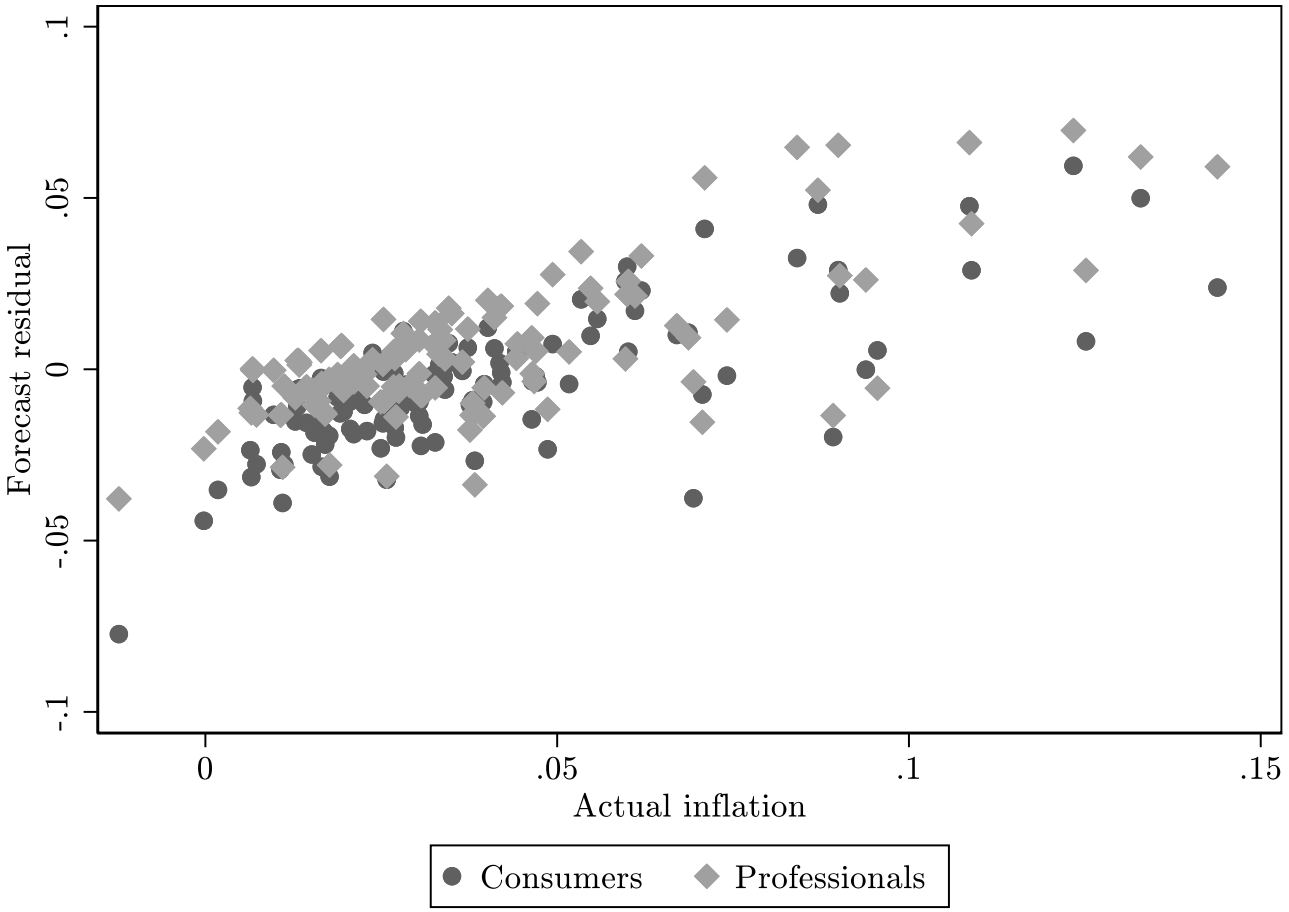
Forecast rationality and efficiency by regime shock and type of expert

	No Shock	*Inflationary shock*	*Disinflationary shock*
A. Are forecasting errors uncorrelated?			
Academic	YES	NO***	NO*
Commercial banking	YES	NO***	NO*
Government	NO***	NO***	NO***
Investment banking	NO***	NO***	NO***
Labor	YES	NO***	YES
Nonfinancial business	NO*	NO***	NO**
Other	YES	NO***	YES
B. Does inflation, on average, move one-for-one with the forecast?			
Academic	NO*	NO***	NO***
Commercial banking	YES	NO***	NO***
Government	NO**	NO***	YES
Investment banking	YES	NO***	NO***
Labor	NO**	NO***	YES
Nonfinancial business	YES	NO***	NO***
Other	NO*	NO***	NO***
C. Is information fully exploited?			
Academic	NO*	NO**	YES
Commercial banking	YES	YES	YES
Government	YES	YES	YES
Investment banking	NO*	NO***	YES
Labor	NO***	YES	NO***
Nonfinancial business	YES	NO***	YES
Other	NO**	NO***	NO**

Some implications

- Merit to Greenspan dictum – once consumers do notice, they pay very close attention.
- 3% is cutting it close.
- Importance of skin in the game.
- Limits of models.

Forecast errors by survey and inflation level



Livingston institutional coverage by decade

Category	*Decades with observations*
Academic institution	All
Commercial banking	All
Consulting	1980s, 1990s, 2000s, 2010s
Federal Reserve	1970s, 1980s
Government	All
Industry trade group	1990s, 2000s, 2010s
Insurance company	1980s, 1990s, 2000s, 2010s
Investment banking	All
Labor	1940s, 1950s, 1960s, 1970s, 1980s, 1990s, 2000s
Nonfinancial business	All
Other / unknown	1940s, 1950s, 1960s, 1970s, 1980s, 1990s, 2000s, 2010s