Surveying the Survey. What can we Learn about the Effect of Monetary Policy on Inflation Expectations?

Michael Pedersen
Central Bank of Chile

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* The opinions expressed are those of author and do not represent those of the Central Bank of Chile or its board members.

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- In this sense, there are two "data" novelties:
  A. The results of the questionnaire: **"Surveying the survey".** On what basis are the expectations formed?
  B. The Chilean financial trader survey (since Dec-09), which is special in the sense that it is made before and *after* the monetary policy meetings.
     - Other similar surveys (e.g. the NY Fed surveys of primary dealers (2011) and of market participants (2014) and the ECB's survey of markets participants' expectations (2019)) are only conducted before policy meetings.

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  B. The Chilean financial trader survey (since Dec-09), which is special in the sense that it is made before and *after* the monetary policy meetings.
     - Other similar surveys (e.g. the NY Fed surveys of primary dealers (2011) and of market participants (2014) and the ECB's survey of markets participants' expectations (2019)) are only conducted before policy meetings.
- A and B make these data particularly suitable for analyzing **"What can we learn about the effect of monetary policy on inflation expectations?"**

Related literature

- **Monetary policy and inflation expectations**
  - Monetary policy decisions (conventional and unconventional) affect investor sentiment. Kurov (JBF, 2010), Lutz (JBF, 2015), Galariotis et al. (JBF, 2018).
  - Central bank communication has impact on expectations. Neuenkirch (JBF, 2013).
  - Monetary policy actions affect the SPF expectations. Oinonen et al. (WP, 2018)
    - Fed information effect. Romer and Romer (AER, 2000), Campbell et al. (BPEA, 2012), Nakamura and Steinsson (QJE, 2018).
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- **Formation of inflation expectations**
  - Lots of studies. E.g. Blanchflower and MacCoille (WP, 2009), Ueda (WP, 2009), Galati et al. (WP, 2011), Łyziak (EEE, 2013), Fritzer and Rumler (OENB: MP&E, 2015), Łyziak and Paloviita (EM, 2018).
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- **Anchoring of inflation expectations**
  - Large literature. For Chile the conclusions suggest that inflation expectations, in general, are well anchored. Gürkaynak et al. (Book Ch, 2007), De Pooter et al. (IJCB, 2014), Medel (REC, 2018).

The rest of the presentation

1. About the Chilean financial trader survey
2. The questionnaire and the results
3. The research question
    a. A theoretical framework
    b. The econometric model
4. Estimation results
5. Final remarks

The financial trader survey (FTS)

- Initiated in December 2009.
- Includes questions on monetary policy rate (MPR), inflation and exchange rates.
- Replies from local banks, other local financial institutions (insurance companies, brokers, security dealers, mutual funds), and offshore banks operating actively in Chile.
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  - Aimed at those responsible for financial decisions.
- Until 2017: Monthly monetary policy meetings (MPM). 24 surveys per year.
  - Results published second and fourth Wednesday of the month.
- From 2018: MPM eight times a year. 16 surveys every year.
  - Results published three working days before the MPM and two working days after the publication of the minute of the same MPM.

The financial trader survey: Observations (pre AND post)
Pre 1st MPM 2010 – Post 8th MPM 2019

Table 1. Observations in the Financial Trader Survey

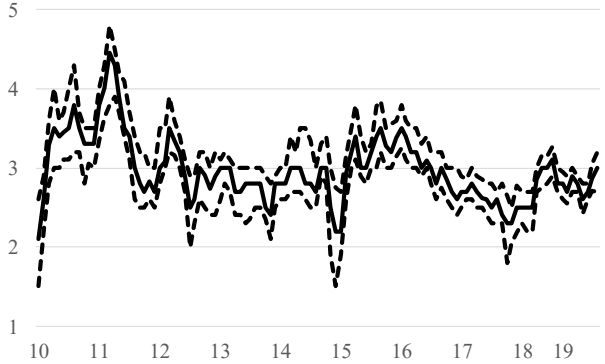
	All inst.	Banks	OFI	Offshore
#obs	6,058	1,490	3,940	628
#inst	105	21	59	25
Average observations per survey	53.6	13.2	34.9	5.6
	(21 / 66)	(7 / 16)	(12 / 43)	(1 / 11)
Institutions that replied questionnaire				
#obs	4,282	1,131	2,894	257
#inst	59	14	37	8
Average observations per survey	37.9	10.0	25.6	2.7
	(11 / 58)	(3 / 14)	(7 / 37)	(1 / 7)

Notes: The rows #obs and #inst show the number of total observations and the number of institutions, respectively, for respondents who replied both pre and post MPM surveys. Numbers in parentheses are minimum and maximum of the monthly replies.

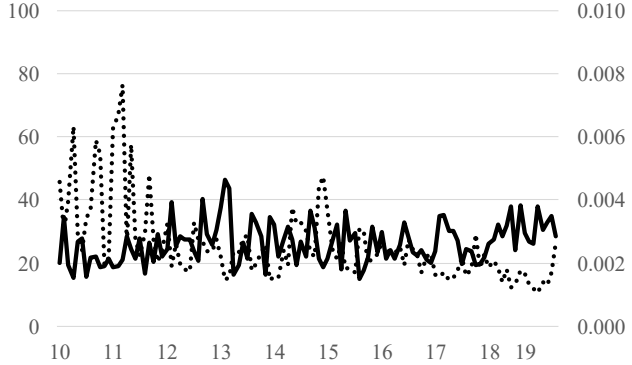
The financial trader survey: Some descriptive statics: Inflation expectations (pre-MPM replies)

One-year-ahead inflation expectations

(a) Median (solid) and deciles 1 and 9 (punctuated)

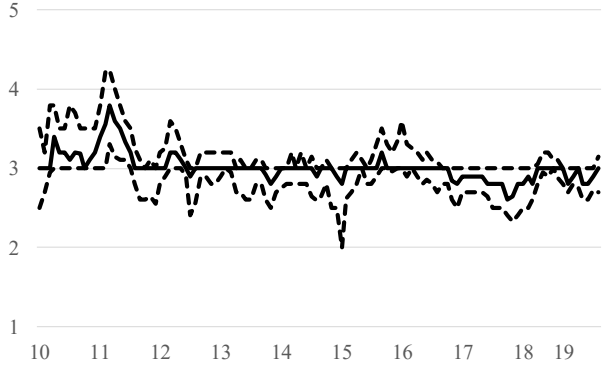


(b) Pct. of answers in mode (solid, lhs) and standard deviation (dotted, rhs)



Two-years-ahead inflation expectations

(c) Median (solid) and deciles 1 and 9 (punctuated)



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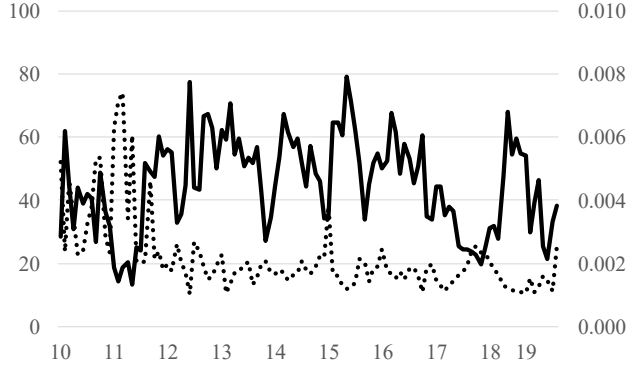


One-year-ahead:

- Lot of heterogeneity

Two-years-ahead:

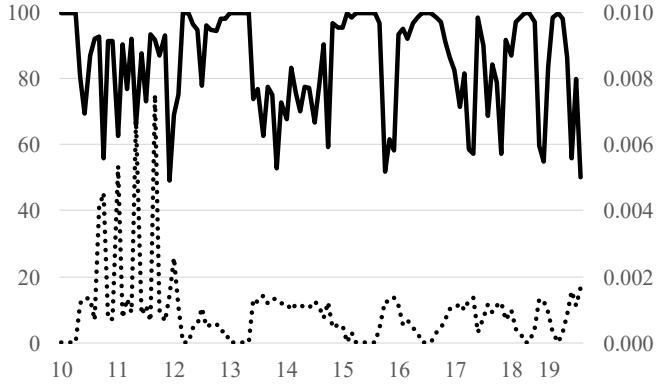
- Less, but still a substantial amount of heterogeneity

The financial trader survey: Some descriptive statics: MPR expectations (pre-MPM replies)

Expectation to post-MPM policy rate

(a) Median (solid) and deciles 1 and 9 (punctuated)

(b) Pct. of answers in mode (solid, lhs) and standard deviation (dotted, rhs)

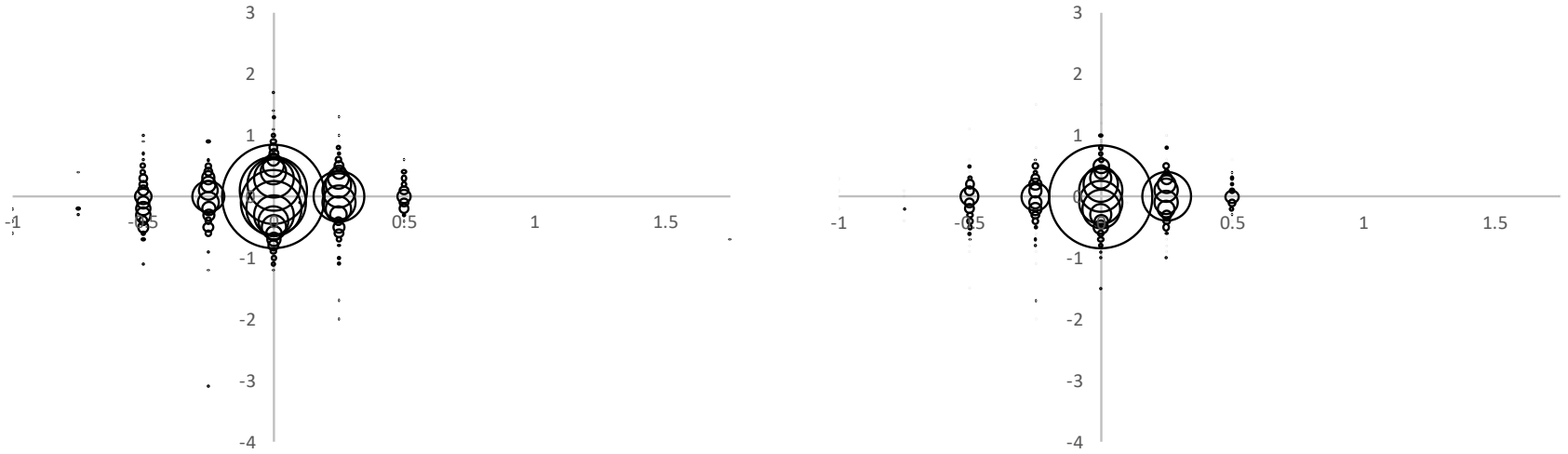


- At times all respondents have the same expectations.
- BUT in most of the periods there are different replies: Some surprises exist.

The financial trader survey: Some descriptive statics: Weighted scatterplots: MPR surprises * updates inflation expectations

Figure 2. Weighted scatterplots: MPR surprises and inflation expectations

(a) One-year-ahead expectations **(b) Two-years-ahead expectations**



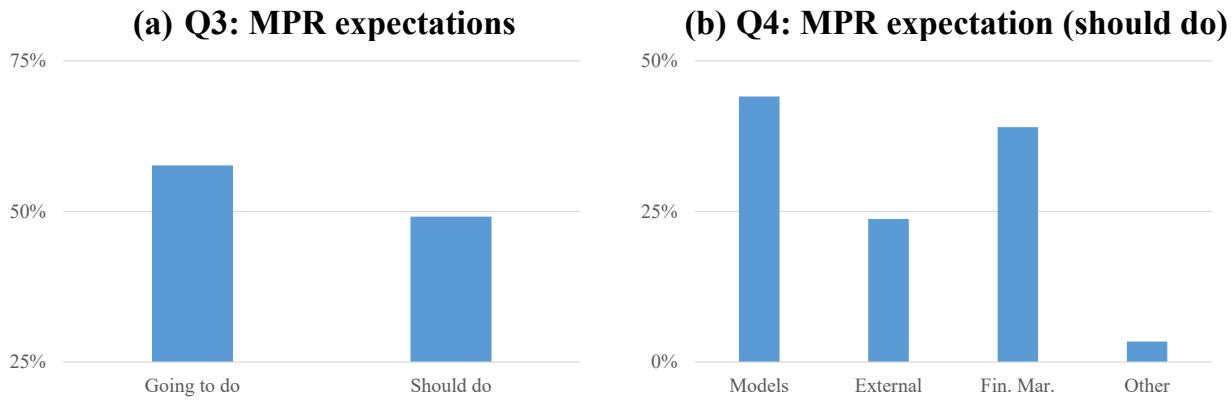
Note: The horizontal axes are the inflation updates (percentage points) and the vertical MPR surprises (basis points). The size of the circles show the number of observations at each point.

- MPR surprises concentrated between -1/2 and +1/2 basis points.
- Inflation updates mainly between -1 and +1 percentage points.
- Simple regressions have slightly positive slopes
  - Positive (negative) surprises tend to result in positive (negative) updates.

The questionnaire (Excl. FX question)

1. Regarding short-term inflation (current month and the next two months. What are your answers based on?	a. Trader projections based on models b. Research area projections based on models c. External projections (consultants, etc.) d. Information extracted from financial markets e. Other. Please specify
2. Regarding medium-term inflation (12 months forward and the following 12 months). What are your answers based on?	a. Trader projections based on models b. Research area projections based on models c. External projections (consultants, etc.) d. Information extracted from financial markets e. Other. Please specify
3. Regarding expectations of MPR. Your answer is based on:	a. What you believe the central bank is going to do. b. What you think the central bank should do.
4. If your answer is 2), please specify what your answer is based on:	a. Trader projections based on models b. Research area projections based on models c. External projections (consultants, etc.) d. Information extracted from financial markets e. Other. Please specify

The questionnaire: Replies to MPR questions



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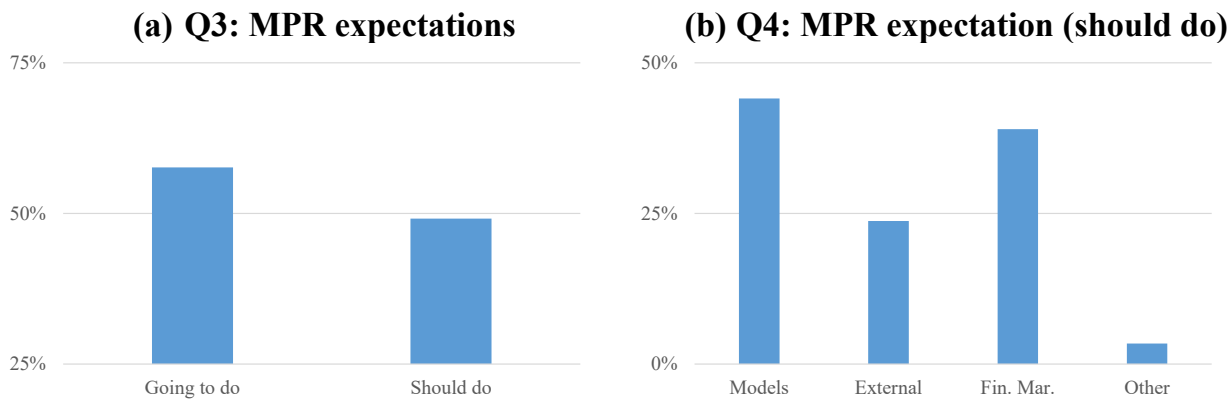

- Most reply what they think the central bank is *going to do*, which does not necessarily coincide with what they think it *should do*.
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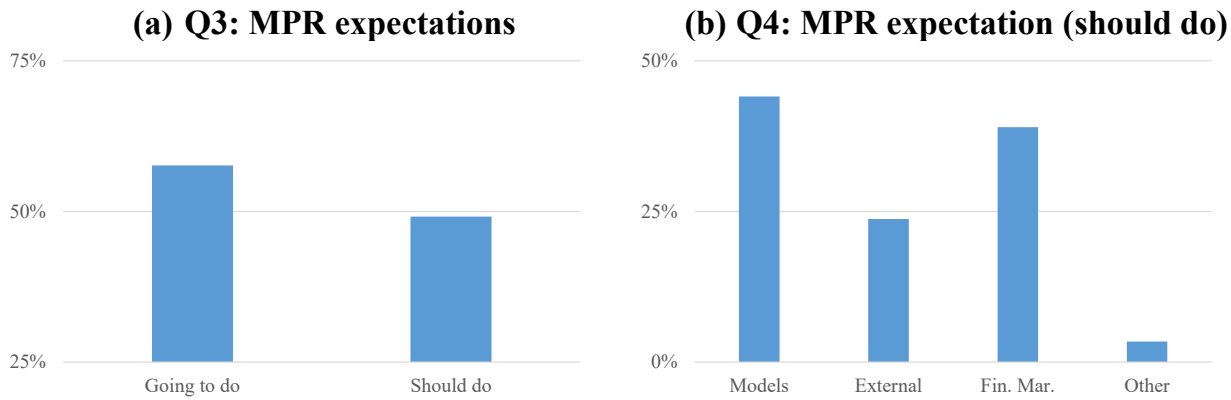
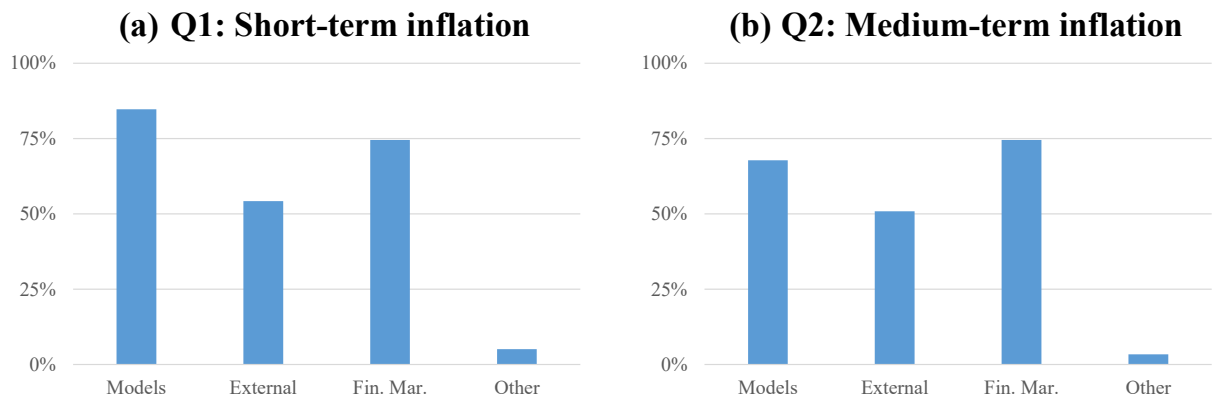


- Most reply what they think the central bank is *going to do*, which does not necessarily coincide with what they think it *should do*.
- Almost half of the respondents reply what they think the central bank *should do*, but not necessarily *will do*.
- Of the *should-do* replies, the main methods to make the projections are models and financial markets.

The questionnaire: Replies to inflation questions



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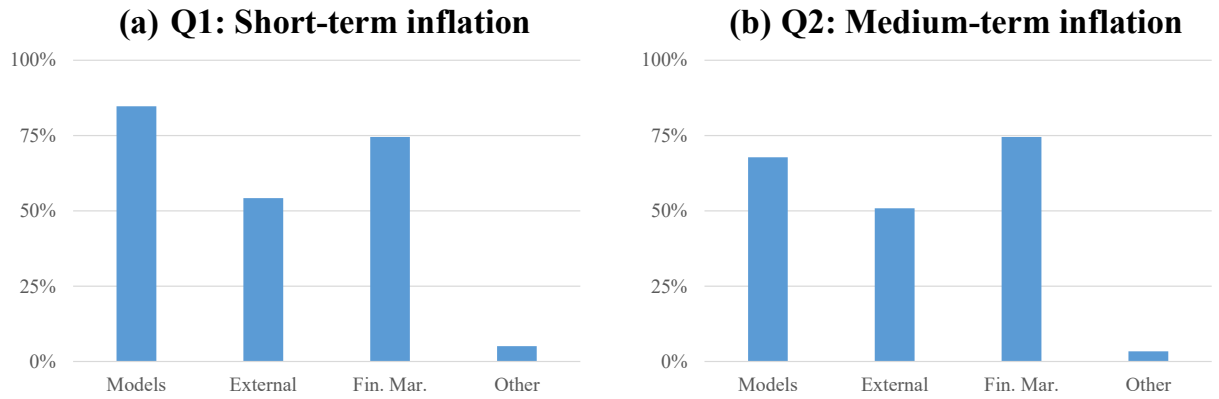

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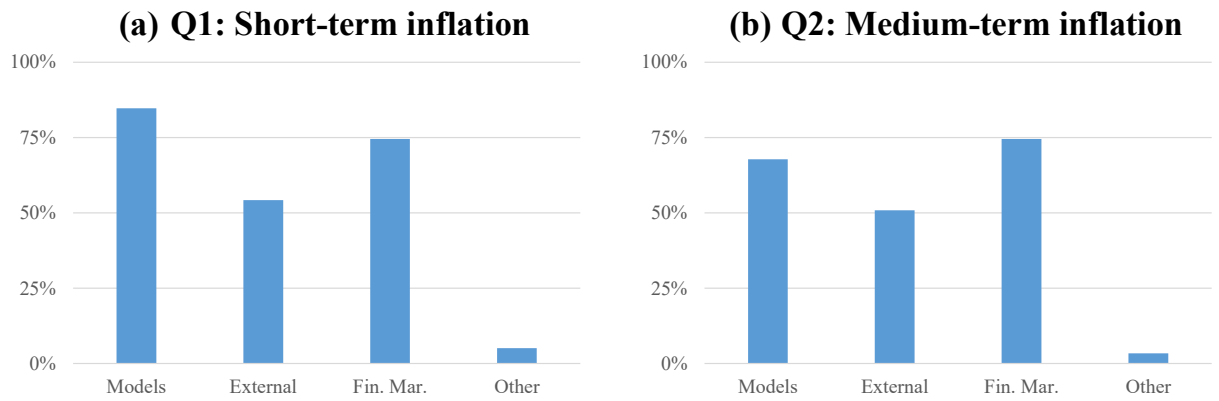

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- 75% of the financial traders base medium-term inflation projections (one and two-years-ahead) on information from financial markets.
- 2/3 of the respondents use the same methods for short- and medium-term forecasting.

Theoretical considerations: Monetary policy (Bauer & Swanson, 2020)

- Consider a simple reaction function that depends on the state of the economy and an exogenous shock:

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  2. Central bank information effect: $E_{t-\delta}(X_t) \neq X_t$.
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  3. *Ex ante* expectation of reaction function is wrong: $E_{t-\delta}\big(f(.)\big) \neq f(.)$
- If expectation formation processes are heterogeneous:
  4. $E_{j,t-\delta} \neq E_{l,t-\delta}$. Maybe surprises for some agents.

Theoretical considerations: Inflation expectations

- *In general*, agent *i* of type *k* makes two inflation projections at time *t*. The update of the inflation expectations is:

$$E_{i_k,t}^{upd}\left(\pi_{t+h}|I_{i_k,t}\right) = E_{i_k,t_2}\left(\pi_{t+h}|I_{i_k,t_2}\right) - E_{i_k,t_1}\left(\pi_{t+h}|I_{i_k,t_1}\right)$$

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- For example, let *k* refer to how the agent perceives the MPR questions (Q3) and let $f_{i_k,t}(\cdot)$ be the function that transforms available information into the forecasts:

$$E^{upd}_{i_k,t}\left(\pi_{t+h}|I_{i_k,t}\right) = f_{i_k,t_2}\left(mpr_t, X_{i_k,t_2}\right) - f_{i_k,t_1}\left(E_{i_k,t_1}(mpr_t), X_{i_k,t_1}\right)$$

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- This expression is translated into an econometric model.

Econometric model

- The type-specific model takes into account fixed effects and annual time dummies:

$$E_{i_k,t_2}(\pi_{t+h}) - E_{i_k,t_1}(\pi_{t+h}) = \alpha_{i_k} + \delta_k \left(mpr_t - E_{i_k,t_1}(mpr_t)\right) + \beta_k' X_{i_k,t} + \gamma_k' Y_t + D_t + \varepsilon_{i_k,t}$$

Contemporaneous inflation news — Short-term exchange rate news

$$X_{i_k,t} = \begin{bmatrix} E_{i_k,t_2}(\pi_t) - E_{i_k,t_1}(\pi_t) \\ E_{t_1}(\pi_{t+h}) - E_{i_k,t_1}(\pi_{t+h}) \end{bmatrix}, Y_t = \begin{bmatrix} fx_{t_2} - fx_{t_1} \\ p_{t_2}^{oil} - p_{t_1}^{oil} \end{bmatrix}$$

Herding — Short-term oil price news

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Contemporaneous inflation news — Herding

Short-term exchange rate news — Short-term oil price news

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- Herding in financial markets is well documented, while the results are mixed for economic forecasts (Batchelor (IJF, 2007) and references therein).
- Estimations of standard errors: Heteroscedastic robust clustered by respondents *and* leave-one-institution-out jackknife replications (small sample).

Results: One-year-ahead inflation expectations

Dependent variable: Change in one-year-ahead inflation expectations

	(1)	(2)	(3)	(4)
Surprise MPR	**0.08*****	**0.09*****	0.05	**0.12*****
	(0.03)	(0.03)	(0.04)	(0.04)
Cont. infl. news	**0.24*****	**0.20*****	**0.21*****	*0.18***
	(0.05)	(0.05)	(0.06)	(0.07)
Herding	**0.50*****	**0.53*****	**0.49*****	**0.57*****
	(0.02)	(0.03)	(0.03)	(0.04)
Exc. Rate[(a)]	**1.08*****	**1.02*****	**0.98*****	**1.04*****
	(0.13)	(0.14)	(0.18)	(0.21)
Oil price[(a)]	**0.50*****	**0.53*****	**0.51*****	**0.58*****
	(0.05)	(0.06)	(0.07)	(0.08)
#obs	5,992	4,232	2,331	2,158
#respondents	105	59	34	29
R^2	0.27	0.27	0.27	0.29
Answer Q3	No	Yes	Yes(3a)	Yes(3b)

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Short-term news and herding important for update of inflation expectations

Herding: Risk aversion. “Do not want to deviate too much from their equals”

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Will-do agents do not take into account MPR surprises. *Should-do* agents do.

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	(0.03)	(0.03)	(0.04)	(0.04)
Cont. infl. news	**0.24*****	**0.20*****	**0.21*****	*0.18***
	(0.05)	(0.05)	(0.06)	(0.07)
Herding	**0.50*****	**0.53*****	**0.49*****	**0.57*****
	(0.02)	(0.03)	(0.03)	(0.04)
Exc. Rate[(a)]	**1.08*****	**1.02*****	**0.98*****	**1.04*****
	(0.13)	(0.14)	(0.18)	(0.21)
Oil price[(a)]	**0.50*****	**0.53*****	**0.51*****	**0.58*****
	(0.05)	(0.06)	(0.07)	(0.08)
#obs	5,992	4,232	2,331	2,158
#respondents	105	59	34	29
R^2	0.27	0.27	0.27	0.29
Answer Q3	No	Yes	Yes(3a)	Yes(3b)

Will-do agents do not take into account MPR surprises. *Should-do* agents do.

Positive coefficient of the MPR surprise: Unexpected contractive monetary policy implies higher expectations. Central Bank has privileged information pointing towards higher inflation rates – The central bank information effect

Results: One-year-ahead inflation expectations

Dependent variable: Change in one-year-ahead inflation expectations

	(1)	(2)	(3)	(4)
Surprise MPR	**0.08*****	**0.09*****	0.05	**0.12*****
	(0.03)	(0.03)	(0.04)	(0.04)
Cont. infl. news	**0.24*****	**0.20*****	**0.21*****	*0.18***
	(0.05)	(0.05)	(0.06)	(0.07)
Herding	**0.50*****	**0.53*****	**0.49*****	**0.57*****
	(0.02)	(0.03)	(0.03)	(0.04)
Exc. Rate[(a)]	**1.08*****	**1.02*****	**0.98*****	**1.04*****
	(0.13)	(0.14)	(0.18)	(0.21)
Oil price[(a)]	**0.50*****	**0.53*****	**0.51*****	**0.58*****
	(0.05)	(0.06)	(0.07)	(0.08)
#obs	5,992	4,232	2,331	2,158
#respondents	105	59	34	29
R^2	0.27	0.27	0.27	0.29
Answer Q3	No	Yes	Yes(3a)	Yes(3b)

Will-do agents do not take into account MPR surprises. *Should-do* agents do.

Possible explanation: Medium-term inflation expectations include an endogenous MPR path, which is not necessarily in accordance with what the agents think the central bank will do in the short run.

Auxiliary regression: The effect of MPR surprises on medium-term MPR expectations

Dependent variable: Change in one-year-ahead MPR expectations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
MPR surp.	**0.17*****	**0.22*****	**0.22*****	**0.28*****	**0.24*****	**0.28*****	**0.17*****	**0.25***
	(0.03)	(0.03)	(0.04)	(0.04)	(0.06)	(0.06)	(0.04)	(0.0
Herding		**-0.38*****		**-0.39*****		**-0.38*****		**-0.41**
		(0.02)		(0.03)		(0.03)		(0.0
#obs	6,002	6,002	4,237	4,237	2,336	2,336	2,158	2,15
#respondents	105	105	59	59	34	34	29	29
R^2	0.07	0.22	0.09	0.24	0.10	0.25	0.09	0.2
Answer Q3	No	No	Yes	Yes	Yes(3a)	Yes(3a)	Yes(3b)	Yes(3

Less than one third of the MPR surprise is carried over to medium-term MPR expectation.

Auxiliary regression: The effect of MPR surprises on medium-term MPR expectations

Dependent variable: Change in one-year-ahead MPR expectations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
MPR surp.	**0.17*****	**0.22*****	**0.22*****	**0.28*****	**0.24*****	**0.28*****	**0.17*****	**0.25***
	(0.03)	(0.03)	(0.04)	(0.04)	(0.06)	(0.06)	(0.04)	(0.0
Herding		**-0.38*****		**-0.39*****		**-0.38*****		**-0.41**
		(0.02)		(0.03)		(0.03)		(0.0
#obs	6,002	6,002	4,237	4,237	2,336	2,336	2,158	2,15
#respondents	105	105	59	59	34	34	29	29
R^2	0.07	0.22	0.09	0.24	0.10	0.25	0.09	0.2
Answer Q3	No	No	Yes	Yes	Yes(3a)	Yes(3a)	Yes(3b)	Yes(3

Less than one third of the MPR surprise is carried over to medium-term MPR expectation.

Negative herding: divergence of projection from the median forecast the month before, which is in line with evidence for forecasters of US interest rates provided by Pierdzioch and Rülke (2013).

Results: One-years-ahead inflation expectations Replies based on, among other things, models (M) / Financial markets (FM)

Table 3. Estimation results: Use of model and financial markets
Dependent variable: Change in one-year-ahead inflation expectations

	(1)	(2)	(3)	(4)	(5)	(6)
Surprise MPR	*0.08**	0.01	**0.14****	**0.09*****	0.07	**0.09*****
	(0.04)	(0.05)	(0.05)	(0.03)	(0.05)	(0.04)
Cont. infl. news	**0.19*****	**0.24*****	0.16**	**0.21*****	**0.22*****	0.20**
	(0.06)	(0.07)	(0.07)	(0.07)	(0.06)	(0.08)
Herding	**0.53*****	**0.50*****	**0.57*****	**0.56*****	**0.51*****	**0.61*****
	(0.03)	(0.03)	(0.05)	(0.03)	(0.03)	(0.04)
Exc. Rate[(a)]	**0.99*****	**0.92*****	**1.08*****	**1.18*****	**1.14*****	**1.17*****
	(0.15)	(0.21)	(0.21)	(0.17)	(0.22)	(0.25)
Oil price[(a)]	**0.45*****	**0.46*****	**0.49*****	**0.60*****	**0.54*****	**0.68*****
	(0.06)	(0.09)	(0.09)	(0.07)	(0.09)	(0.09)
#obs	2,961	1,609	1,609	3,187	1,763	1,681
#respondents	40	23	21	44	25	23
R^2	0.28	0.29	0.28	0.29	0.29	0.30
Answer Q3	Yes	Yes(3a)	Yes(3b)	Yes	Yes(3a)	Yes(3b)
M / FM	M	M	M	FM	FM	FM

No large changes when conditioning on whether agents apply models or information from financial markets for forecasting.

Results: One-years-ahead inflation expectations Replies based on, among other things, models (M) / Financial markets (FM)

Table 3. Estimation results: Use of model and financial markets
Dependent variable: Change in one-year-ahead inflation expectations

	(1)	(2)	(3)	(4)	(5)	(6)
Surprise MPR	*0.08**	0.01	**0.14****	**0.09*****	0.07	**0.09*****
	(0.04)	(0.05)	(0.05)	(0.03)	(0.05)	(0.04)
Cont. infl. news	**0.19*****	**0.24*****	0.16**	**0.21*****	**0.22*****	0.20**
	(0.06)	(0.07)	(0.07)	(0.07)	(0.06)	(0.08)
Herding	**0.53*****	**0.50*****	**0.57*****	**0.56*****	**0.51*****	**0.61*****
	(0.03)	(0.03)	(0.05)	(0.03)	(0.03)	(0.04)
Exc. Rate[(a)]	**0.99*****	**0.92*****	**1.08*****	**1.18*****	**1.14*****	**1.17*****
	(0.15)	(0.21)	(0.21)	(0.17)	(0.22)	(0.25)
Oil price[(a)]	**0.45*****	**0.46*****	**0.49*****	**0.60*****	**0.54*****	**0.68*****
	(0.06)	(0.09)	(0.09)	(0.07)	(0.09)	(0.09)
#obs	2,961	1,609	1,609	3,187	1,763	1,681
#respondents	40	23	21	44	25	23
R^2	0.28	0.29	0.28	0.29	0.29	0.30
Answer Q3	Yes	Yes(3a)	Yes(3b)	Yes	Yes(3a)	Yes(3b)
M / FM	M	M	M	FM	FM	FM

No large changes when conditioning on whether agents apply models or information from financial markets for forecasting.

Herding is a robust result.

Small sample corrected standard errors cast doubt on whether the *should–do* agents adjust expectations to contemporaneous inflation news.

Results: One-years-ahead inflation expectations Replies based ONLY on M / FM

Table 4. Estimation results: Use of model or financial markets
Dependent variable: Change in one-year-ahead inflation expectations

	(1)	(2)	(3)	(4)	(5)	(6)
Surprise MPR	0.12	-0.02	0.24	**0.13****	**0.19****	0.08
	(0.09)	(0.11)	(0.12)	(0.05)	(0.08)	(0.06)
Cont. infl. news	0.13	0.19	0.11	**0.22*****	**0.16****	**0.30*****
	(0.09)	(0.17)	(0.09)	(0.05)	(0.06)	(0.08)
Herding	**0.46*****	**0.46*****	**0.47*****	**0.54*****	**0.51*****	**0.57*****
	(0.05)	(0.06)	(0.09)	(0.04)	(0.06)	(0.05)
Exc. Rate[(a)]	**0.51****	*0.51***	0.55	**1.17*****	**1.36*****	0.96
	(0.19)	(0.20)	(0.35)	(0.34)	(0.40)	(0.62)
Oil price[(a)]	**0.30*****	**0.39****	*0.20**	**0.73*****	**0.67*****	**0.79*****
	(0.09)	(0.15)	(0.10)	(0.11)	(0.13)	(0.17)
#obs	911	434	477	1,137	588	549
#respondents	13	7	6	17	9	8
R^2	0.25	0.30	0.25	0.29	0.29	0.30
Answer Q3	Yes	Yes(3a)	Yes(3b)	Yes	Yes(3a)	Yes(3b)
M / FM	M	M	M	FM	FM	FM

BUT when considering agents that ONLY apply models or financial markets to predict, the results change.

Results: One-years-ahead inflation expectations
Replies based ONLY on M / FM

Table 4. Estimation results: Use of model or financial markets
Dependent variable: Change in one-year-ahead inflation expectations

	(1)	(2)	(3)	(4)	(5)	(6)
Surprise MPR	0.12	-0.02	0.24	**0.13****	**0.19****	0.08
	(0.09)	(0.11)	(0.12)	(0.05)	(0.08)	(0.06)
Cont. infl. news	0.13	0.19	0.11	**0.22*****	**0.16****	**0.30*****
	(0.09)	(0.17)	(0.09)	(0.05)	(0.06)	(0.08)
Herding	**0.46*****	**0.46*****	**0.**	*****	**0.51*****	**0.57*****
	(0.05)				(0.06)	(0.05)
Exc. Rate[(a)]	**0.51****				**1.36*****	0.96
	(0.19)			(0.34)	(0.40)	(0.62)
Oil price[(a)]	**0.30*****	**0.59***	*0.20**	**0.73*****	**0.67*****	**0.79*****
	(0.09)	(0.15)	(0.10)	(0.11)	(0.13)	(0.17)
#obs	911	434	477	1,137	588	549
#respondents	13	7	6	17	9	8
R^2	0.25	0.30	0.25	0.29	0.29	0.30
Answer Q3	Yes	Yes(3a)	Yes(3b)	Yes	Yes(3a)	Yes(3b)
M / FM	M	M	M	FM	FM	FM

Small sample caveat

BUT when considering agents that ONLY apply models or financial markets to predict, the results change.

Results: One-years-ahead inflation expectations Replies based ONLY on M / FM

Table 4. Estimation results: Use of model or financial markets
Dependent variable: Change in one-year-ahead inflation expectations

	(1)	(2)	(3)	(4)	(5)	(6)
Surprise MPR	0.12	-0.02	0.24	**0.13****	**0.19****	0.08
	(0.09)	(0.11)	(0.12)	(0.05)	(0.08)	(0.06)
Cont. infl. news	0.13	0.19	0.11	**0.22*****	**0.16****	**0.30*****
	(0.09)	(0.17)	(0.09)	(0.05)	(0.06)	(0.08)
Herding	**0.46*****	**0.46*****	**0.47*****	**0.54*****	**0.51*****	**0.57*****
	(0.05)	(0.06)	(0.09)	(0.04)	(0.06)	(0.05)
Exc. Rate[(a)]	**0.51****	*0.51***	0.55	**1.17*****	**1.36*****	0.96
	(0.19)	(0.20)	(0.35)	(0.34)	(0.40)	(0.62)
Oil price[(a)]	**0.30*****	**0.39****	*0.20**	**0.73*****	**0.67*****	**0.79*****
	(0.09)	(0.15)	(0.10)	(0.11)	(0.13)	(0.17)
#obs	911	434	477	1,137	588	549
#respondents	13	7	6	17	9	8
R^2	0.25	0.30	0.25	0.29	0.29	0.30
Answer Q3	Yes	Yes(3a)	Yes(3b)	Yes	Yes(3a)	Yes(3b)
M / FM	M	M	M	FM	FM	FM

BUT when considering agents that ONLY apply models or financial markets to predict, the results change.

It is only the *will-do* agents that employ information ONLY from financial markets when forecasting, that change inflation expectations in response to MPR surprises.
Maybe because financial markets have *will-do* expectations incorporated in prices.

Possible explanation: Model-based projections have endogenous MPR path incorporated.

Results: One-years-ahead inflation expectations Replies based ONLY on M / FM

Table 4. Estimation results: Use of model or financial markets
Dependent variable: Change in one-year-ahead inflation expectations

	(1)	(2)	(3)	(4)	(5)	(6)
Surprise MPR	0.12	-0.02	0.24	**0.13****	**0.19****	0.08
	(0.09)	(0.11)	(0.12)	(0.05)	(0.08)	(0.06)
Cont. infl. news	0.13	0.19	0.11	**0.22*****	**0.16****	**0.30*****
	(0.09)	(0.17)	(0.09)	(0.05)	(0.06)	(0.08)
Herding	**0.46*****	**0.46*****	**0.47*****	**0.54*****	**0.51*****	**0.57*****
	(0.05)	(0.06)	(0.09)	(0.04)	(0.06)	(0.05)
Exc. Rate[(a)]	**0.51****	*0.51***	0.55	**1.17*****	**1.36*****	0.96
	(0.19)	(0.20)	(0.35)	(0.34)	(0.40)	(0.62)
Oil price[(a)]	**0.30*****	**0.39****	*0.20**	**0.73*****	**0.67*****	**0.79*****
	(0.09)	(0.15)	(0.10)	(0.11)	(0.13)	(0.17)
#obs	911	434	477	1,137	588	549
#respondents	13	7	6	17	9	8
R^2	0.25	0.30	0.25	0.29	0.29	0.30
Answer Q3	Yes	Yes(3a)	Yes(3b)	Yes	Yes(3a)	Yes(3b)
M / FM	M	M	M	FM	FM	FM

BUT when considering agents that ONLY apply models or financial markets to project, the results change.

Not obvious that short-terms news affect medium-term model-based expectations.

Again the herding result is robust.

Main take-aways: One-year-ahead inflation expectations

- *Will-do* agents do not seem to take into account MPR surprises while the *should-do* agents do.
  - This could imply that that the medium-term inflation expectations include and endogenous MPR path, which is not necessarily in accordance with what the agents think the central bank will do in the short run.
    - This is partly supported by a regression of MPR surprises on medium-term MPR expectations: Less than one third of the surprise is carried over to expectations for longer horizons
- However, if expectations are based ONLY on models, MPR surprises do not affect medium-term inflation expectations. Of those that ONLY use financial markets to make the forecasts, the *will-do* agents are the only ones that adjust inflation expectations to MPR surprises
- Short-term news affect medium-term inflation expectations.
- Heading is present in the one-year-ahead inflation expectations.
  - Possible explanation: Risk-aversion: Do not want to deviate too much from their equals.

Results: Two-years-ahead inflation expectations

Dependent variable: Change in two-years-ahead inflation expectations

	(1)	(2)	(3)	(4)
Surprise MPR	-0.02	-0.004	-0.01	0.002
	(0.02)	(0.03)	(0.04)	(0.04)
Cont. infl. news	**0.10*****	**0.09*****	**0.13*****	0.07*
	(0.03)	(0.03)	(0.03)	(0.04)
Herding	**0.48*****	**0.46*****	**0.42*****	**0.50*****
	(0.02)	(0.02)	(0.02)	(0.02)
Exc. Rate[(a)]	**0.29*****	**0.32****	*0.22**	0.37
	(0.12)	(0.14)	(0.12)	(0.24)
Oil price[(a)]	**0.16*****	**0.18*****	**0.14****	**0.23*****
	(0.04)	(0.05)	(0.05)	(0.07)
#obs	5,992	4,232	2,331	2,158
#respondents	105	59	34	29
R^2	0.27	0.25	0.23	0.27
Answer Q3	No	Yes	Yes(3a)	Yes(3b)

Results: Two-years-ahead inflation expectations

Dependent variable: Change in two-years-ahead inflation expectations

	(1)	(2)	(3)	(4)
Surprise MPR	-0.02	-0.004	-0.01	0.002
	(0.02)	(0.03)	(0.04)	(0.04)
Cont. infl. news	**0.10*****	**0.09*****	**0.13*****	0.07*
	(0.03)	(0.03)	(0.03)	(0.04)
Herding	**0.48*****	**0.46*****	**0.42*****	**0.50*****
	(0.02)	(0.02)	(0.02)	(0.02)
Exc. Rate[(a)]	**0.29*****	**0.32****	*0.22**	0.37
	(0.12)	(0.14)	(0.12)	(0.24)
Oil price[(a)]	**0.16*****	**0.18*****	**0.14****	**0.23*****
	(0.04)	(0.05)	(0.05)	(0.07)
#obs	5,992	4,232	2,331	2,158
#respondents	105	59	34	29
R^2	0.27	0.25	0.23	0.27
Answer Q3	No	Yes	Yes(3a)	Yes(3b)

No evidence that MPR surprises affect inflation expectations two-years-ahead.

Results: Two-years-ahead inflation expectations

Dependent variable: Change in two-years-ahead inflation expectations

	(1)	(2)	(3)	(4)
Surprise MPR	-0.02	-0.004	-0.01	0.002
	(0.02)	(0.03)	(0.04)	(0.04)
Cont. infl. news	**0.10*****	**0.09*****	**0.13*****	0.07*
	(0.03)	(0.03)	(0.03)	(0.04)
Herding	**0.48*****	**0.46*****	**0.42*****	**0.50*****
	(0.02)	(0.02)	(0.02)	(0.02)
Exc. Rate[(a)]	**0.29*****	**0.32****	*0.22**	0.37
	(0.12)	(0.14)	(0.12)	(0.24)
Oil price[(a)]	**0.16*****	**0.18*****	**0.14****	**0.23*****
	(0.04)	(0.05)	(0.05)	(0.07)
#obs	5,992	4,232	2,331	2,158
#respondents	105	59	34	29
R^2	0.27	0.25	0.23	0.27
Answer Q3	No	Yes	Yes(3a)	Yes(3b)

No evidence that MPR surprises affect inflation expectations two-years-ahead.

Short-term news seem to affect long-term expectations to some extent. Financial traders' two-years-ahead expectations are not anchored when applying this definition of anchoring (e.g. Bernanke (2007)).

Results: Two-years-ahead inflation expectations

Dependent variable: Change in two-years-ahead inflation expectations

	(1)	(2)	(3)	(4)
Surprise MPR	-0.02	-0.004	-0.01	0.002
	(0.02)	(0.03)	(0.04)	(0.04)
Cont. infl. news	**0.10*****	**0.09*****	**0.13*****	0.07*
	(0.03)	(0.03)	(0.03)	(0.04)
Herding	**0.48*****	**0.46*****	**0.42*****	**0.50*****
	(0.02)	(0.02)	(0.02)	(0.02)
Exc. Rate[(a)]	**0.29*****	**0.32****	*0.22**	0.37
	(0.12)	(0.14)	(0.12)	(0.24)
Oil price[(a)]	**0.16*****	**0.18*****	**0.14****	**0.23*****
	(0.04)	(0.05)	(0.05)	(0.07)
#obs	5,992	4,232	2,331	2,158
#respondents	105	59	34	29
R^2	0.27	0.25	0.23	0.27
Answer Q3	No	Yes	Yes(3a)	Yes(3b)

No evidence that MPR surprises affect inflation expectations two-years-ahead.

Short-term news seem to affect long-term expectations to some extent. Financial traders' two-years-ahead expectations are not anchored when applying this definition of anchoring (e.g. Bernanke (2007)).

Herding is also present in the two-years-ahead expectations.

Results: Two-years-ahead inflation expectations Replies based on, among other things, models (M) / Financial markets (FM)

Table 6. Estimation results: Use of model and financial markets
Dependent variable: Change in two-years-ahead inflation expectations

	(1)	(2)	(3)	(4)	(5)	(6)
Surprise MPR	-0.005	-0.02	0.01	0.02	0.03	0.01
	(0.03)	(0.04)	(0.04)	(0.03)	(0.04)	(0.05)
Cont. infl. news	0.08**	**0.14****	0.06	*0.10***	**0.13****	0.08
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.05)
Herding	**0.47****	**0.43****	**0.50****	**0.48****	**0.45****	**0.50****
	(0.02)	(0.03)	(0.02)	(0.02)	(0.03)	(0.02)
Exc. Rate[(a)]	**0.30****	*0.27**	0.27	*0.32**	*0.29**	0.28
	(0.14)	(0.14)	(0.23)	(0.18)	(0.15)	(0.31)
Oil price[(a)]	**0.17****	**0.17****	**0.18****	**0.20****	*0.13***	**0.28****
	(0.05)	(0.07)	(0.08)	(0.06)	(0.06)	(0.09)
#obs	2,961	1,609	1,609	3,187	1,763	1,681
#respondents	40	23	21	44	25	23
R^2	0.25	0.24	0.27	0.27	0.26	0.29
Answer Q3	Yes	Yes(3a)	Yes(3b)	Yes	Yes(3a)	Yes(3b)
M / FM	M	M	M	FM	FM	FM

Results do not change when conditioning on whether agents employ models or information from financial markets.

Results: Two-years-ahead inflation expectations Replies based on, among other things, models (M) / Financial markets (FM)

Table 6. Estimation results: Use of model and financial markets
Dependent variable: Change in two-years-ahead inflation expectations

	(1)	(2)	(3)	(4)	(5)	(6)
Surprise MPR	-0.005	-0.02	0.01	0.02	0.03	0.01
	(0.03)	(0.04)	(0.04)	(0.03)	(0.04)	(0.05)
Cont. infl. news	0.08**	**0.14****	0.06	*0.10***	**0.13****	0.08
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.05)
Herding	**0.47****	**0.43****	**0.50****	**0.48****	**0.45****	**0.50****
	(0.02)	(0.03)	(0.02)	(0.02)	(0.03)	(0.02)
Exc. Rate[(a)]	**0.30****	*0.27**	0.27	*0.32**	*0.29**	0.28
	(0.14)	(0.14)	(0.23)	(0.18)	(0.15)	(0.31)
Oil price[(a)]	**0.17****	**0.17****	**0.18****	**0.20****	*0.13***	**0.28****
	(0.05)	(0.07)	(0.08)	(0.06)	(0.06)	(0.09)
#obs	2,961	1,609	1,609	3,187	1,763	1,681
#respondents	40	23	21	44	25	23
R^2	0.25	0.24	0.27	0.27	0.26	0.29
Answer Q3	Yes	Yes(3a)	Yes(3b)	Yes	Yes(3a)	Yes(3b)
M / FM	M	M	M	FM	FM	FM

Results do not change when conditioning on whether agents employ models or information from financial markets.

Herding is a robust result.

Small sample corrected standard errors cast doubt on whether the *should–do* agents adjust expectations to contemporaneous inflation news.

Results: Two-years-ahead inflation expectations Replies based ONLY on M / FM

Dependent variable: Change in two-years-ahead inflation expectations

	(1)	(2)	(3)	(4)	(5)	(6)
Surprise MPR	-0.06	-0.10	-0.03	0.02	0.06	-0.02
	(0.04)	(0.07)	(0.02)	(0.06)	(0.07)	(0.10)
Cont. infl. news	0.06	0.11	0.04	**0.12****	0.12	0.14
	(0.06)	(0.07)	(0.08)	(0.06)	(0.07)	(0.09)
Herding	**0.43*****	**0.35*****	**0.49*****	**0.47*****	**0.45*****	**0.49*****
	(0.06)	(0.03)	(0.08)	(0.04)	(0.04)	(0.05)
Exc. Rate[(a)]	0.28	-0.11	**0.63****	0.36	0.12	0.65
	(0.19)	(0.23)	(0.18)	(0.36)	(0.30)	(0.68)
Oil price[(a)]	*0.11**	0.15	0.07	*0.19**	0.04	*0.36**
	(0.05)	(0.08)	(0.07)	(0.09)	(0.05)	(0.18)
#obs	911	434	477	1,137	588	549
#respondents	13	7	6	17	9	8
R^2	0.21	0.20	0.24	0.27	0.24	0.30
Answer Q3	Yes	Yes(3a)	Yes(3b)	Yes	Yes(3a)	Yes(3b)
M / FM	M	M	M	FM	FM	FM

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Replies based ONLY on M / FM

Dependent variable: Change in two-years-ahead inflation expectations

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Small sample caveat

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MPR-results do not change when conditioning on whether agents employ models or information from financial markets.

Several of the traders that only apply models when forecasting seem to have two-years-ahead expectations anchored. Maybe because the inflation rate in the models converges to a certain level after two years.

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Dependent variable: Change in two-years-ahead inflation expectations

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Several of the traders that only apply models when forecasting seem to have two-years-ahead expectations anchored. Maybe because the inflation rate in the models converges to a certain level after two years.

Also several of the traders that only employ information extracted from financial markets seem to have anchored inflation expectations.

Take-aways: Two-years-ahead inflation expectations

- MPR surprises do not seem to affect financial traders long-run expectations.
- Herding is also a prominent feature of two-years-ahead inflation expectations
- Short-term news seem to have effect on two-years-ahead inflation expectations
  - Implication: These expectations are not anchored when applying this definition of anchoring (e.g. Bernanke (2007)).
- However, the de-anchoring does not seem to be present for several of the traders whose forecasts are based ONLY on models or information extracted from financial markets

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  - Points to the importance of a precise and clear formulation of survey questions.

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  - Points to the importance of a precise and clear formulation of survey questions.
- Agents that understand MPR questions as what the CB *should do* adjust medium-term expectations in response to MPR surprises. The *will-do* agents do not.
  - Could imply that the "model" financial traders have in mind when making their forecasts include an endogenous MPR path, which does not necessarily coincide with what they think the CB will do in the short run.
  - If this is the case, it possess an important communication challenge for the CB.

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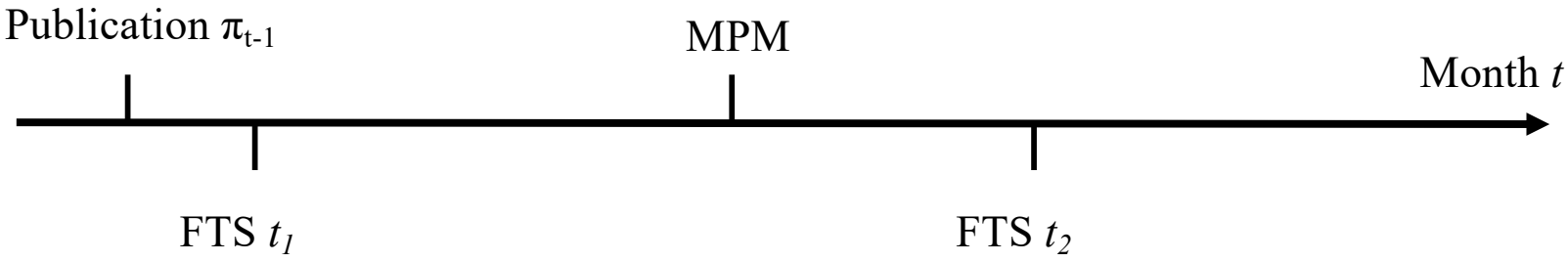
- No strong evidence indicates that MPR surprises matter for two-years-ahead expectations.
- Short-term news generally affect the medium- and long-term inflation expectations.
  - Expectations of financial traders may not be anchored.
- Financial traders herd inflation expectations.
  - Aversion to deviations from the projections of equals.

Thank you for your attention!

FTS: Timing and measuring contemporaneous inflation news: Until 2017



Short-term news that affect inflation rate: $E_{i_k,t_2}(\pi_t) - E_{i_k,t_1}(\pi_t)$

FTS: Timing and measuring contemporaneous inflation news: From 2018