

Medium- vs. short-term consumer inflation expectations: evidence from a new euro area survey

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Introduction

Motivation (1/2)

- Focus on consumer inflation expectations due to their importance for monetary policy making:
 - ▶ expectations formation (Candia et al., 2020; Christelis et al., 2020, D'Acunto et al., 2019a,b,c; Easaw et al., 2013; Łyziak and Paloviita, 2017; Rumler and Valderrama, 2020)
 - ▶ role in economic decisions (Andrade et al., 2020; Duca-Radu et al., 2020)
 - ▶ use as a proxy for firm's expectations (Coibion and Gorodnichenko, 2015; Friedrich, 2016)
 - ▶ monetary policy communication (Binder, 2017; Coibion et al., 2019, 2020; Kryvtsov and Petersen, 2020; Lamla and Vinogradov, 2019).

Motivation (2/2)

- Scarce knowledge on formation of medium-term inflation expectations of euro area consumers, mainly due to lack of data
- Limitations of alternative measures of inflation expectations of european consumers (European Commission Consumer Survey):
 - ▶ only short-term horizon
 - ▶ no panel components
 - ▶ no uncertainty measures

Aim

- We use new data to investigate responsiveness of medium-term inflation expectations of euro area consumers to short-term economic developments
- We account for possible impact of Covid-19 pandemic on inflation expectations
- We study link between trust in the ECB and inflation expectations
- Responsiveness is closely related to the concept of anchoring (e.g., Beechey et al., 2011; Ciccarelli and Osbat, 2017; Kumar et al., 2015), but...
 - ▶ anchoring refers to a long-term horizon
 - ▶ anchoring captures more features than limited responsiveness to short-term developments

Related literature (1/2)

- Responsiveness of medium- and long-term inflation expectations of professional forecasters and financial market participants
 - ▶ some evidence of increased sensitivity of euro area expectations after the global financial crisis and in the low inflation environment (Bouno and Formai, 2018; Łyziak and Paloviita, 2017; Corsello et al., 2019), but other studies suggest no signs of de-anchoring (Apokritis et al., 2019; Yetman, 2020)
 - ▶ some evidence on asymmetric effects of positive and negative CPI surprises, positive and negative deviations of CPI inflation from inflation aim (Corsello et al., 2019; Ehrmann 2015; Moessner and Takas, 2020)
 - ▶ higher pass-through from short-term expectations to long-term expectations in emerging economies than in advanced economies (Moessner and Takas, 2020)

Related literature (2/2)

- Growing literature on the impact of the Covid-19 on consumer expectations and economic decisions
 - ▶ Binder (2020), Apergis and Apergis (2020), Diettrich et al. (2020) find that the pandemic contributed to higher inflation expectations
 - ▶ other authors find no effect (Coibion et al., 2020; Armantier et al., 2020)
- Nexus between trust in the ECB and level of consumer inflation expectations
 - ▶ higher trust lowers inflation expectations and reduces uncertainty, as well as increases accuracy of expectations (Christelis et al., 2020; Mellina and Schmidt, 2018; Rumler and Valderrama, 2020)

Data and methods

Data

- New monthly online consumer survey: the ECB Consumer Expectations Survey
- Six survey waves from a pilot phase: from April to September 2020
- Data from six countries (Belgium, France, Germany, Italy, the Netherlands, Spain) accounting for 86% of the euro area (in terms of HICP country weights)
- Micro data with panel structure: about 60 000 questionnaires completed by more than 15 000 consumers

Quantitative survey questions on inflation views

- Inflation perceptions:

How much higher/lower do you think prices in general are now compared with 12 months ago in the country you currently live in? Please give your best guess of the change in percentage terms.

- Short-term inflation expectations:

How much higher/lower do you think prices in general will be 12 months from now in the country you currently live in? Please give your best guess of the change in percentage terms.

- Medium-term inflation expectations:

By about what percentage do you expect prices in general in the country you currently live in to increase/decrease over the 12-month period between [survey month, year+2] and [survey month, year+3]? Please give your best guess of the change in percentage terms.

Other relevant survey questions

- Covid-19 concerns:
 - ▶ *How concerned are you about the impact of the coronavirus (COVID-19) on ... Your country's economic situation.*
 - ▶ scale: from 0 (not concerned at all) to 10 (extremely concerned).
- Trust in the ECB institution
 - ▶ *How much do you trust... The European Central Bank.*
 - ▶ scale: from 0 (no trust at all) to 10 (trust completely).

Medium-term inflation views

Figure: Aggregated (medians)

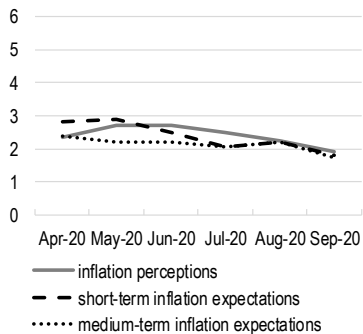
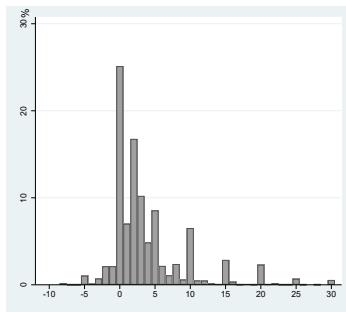


Figure: Individual (distribution)



Covid-19 concerns

Figure: Distribution of responses

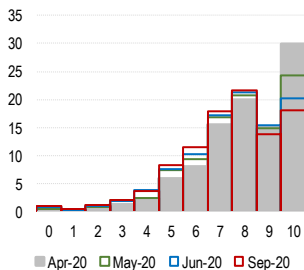
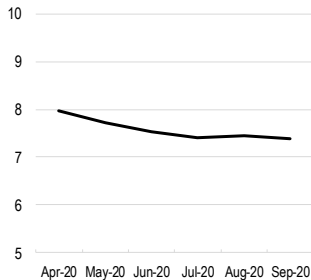


Figure: Average level of concerns



Declared trust in the ECB

Figure: Distribution of responses

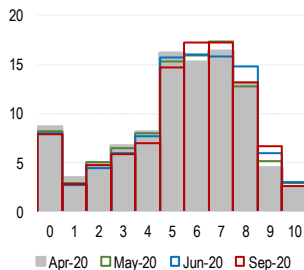
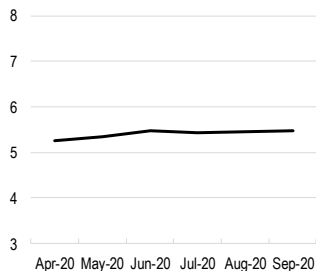


Figure: Average level of trust



Changes in individual inflation views: $\Delta\pi_{it}^h = \pi_{it}^h - \pi_{it-1}^h$

	perceptions	short-term expectations	medium-term expectations
Mean absolute change	3.2 pp	3.6 pp	4.0 pp
St. dev. of mean absolute change	5.0 pp	5.5 pp	6.5 pp
Share of no change	28%	25%	24%
Share of increases	34%	36%	36%
Share of decreases	38%	40%	40%

Responsiveness of inflation views – baseline regressions

$$\Delta\pi_{it}^{3Y} = \alpha_i + \beta\Delta\pi_{it}^P + \gamma Cov_{it} + \mu X_{it} + \epsilon_{it}$$

$$\Delta\pi_{it}^{3Y} = \alpha_i + \beta\Delta\pi_{it}^{1Y} + \gamma Cov_{it} + \mu X_{it} + \epsilon_{it}$$

$$\Delta\pi_{it}^{1Y} = \alpha_i + \beta\Delta\pi_{it}^P + \gamma Cov_{it} + \mu X_{it} + \epsilon_{it}$$

where:

- $\Delta\pi^{3Y}$ – changes in medium-term inflation expectations
- $\Delta\pi^{1Y}$ – changes in short-term inflation expectations
- $\Delta\pi^P$ – changes in inflation perceptions
- Cov – Covid-19 dummy variable (1 = increased concern)
- X – a set of control variables (demography, sentiment, individual uncertainty, time dummies, country dummies).

Responsiveness of inflation views – interactions with trust in the ECB

$$\Delta\pi_{it}^{3Y} = \alpha_i + \beta_1\Delta\pi_{it}^P + \beta_1^*I_{it}\Delta\pi_{it}^P + \gamma Cov_{it} + \gamma^*I_{it}Cov_{it} + \beta_0I_{it} + \mu X_{it} + \epsilon_{it}$$

$$\Delta\pi_{it}^{3Y} = \alpha_i + \beta_1\Delta\pi_{it}^{1Y} + \beta_1^*I_{it}\Delta\pi_{it}^{1Y} + \gamma Cov_{it} + \gamma^*I_{it}Cov_{it} + \beta_0I_{it} + \mu X_{it} + \epsilon_{it}$$

$$\Delta\pi_{it}^{1Y} = \alpha_i + \beta_1\Delta\pi_{it}^P + \beta_1^*I_{it}\Delta\pi_{it}^P + \gamma Cov_{it} + \gamma^*I_{it}Cov_{it} + \beta_0I_{it} + \mu X_{it} + \epsilon_{it}$$

where dummy variable I is equal to 1 if a consumer declares high trust in the ECB

Results

Main results (1/2)

Variable	$\Delta\pi^{1Y}$	$\Delta\pi^{3Y}$
$\Delta\pi^P$	0.38***	0.19***
<i>Cov</i>	0.33***	0.21**
<i>demographics</i>	yes	yes
<i>sentiment</i>	yes	yes
<i>country effects</i>	yes	yes
<i>time effects</i>	yes	yes
<i>N</i>	42 218	42 218
$R^2_{overall}$	0.121	0.026

Notes: Random effect estimations with robust standard errors (clustered at country level).

*/**/** denotes statistical significance at 10%, 5% and 1% level.

- both, short- and medium-term expectations adjust to changes in perceived inflation
- both, short- and medium-term expectations increased due to Covid-19
- smaller responsiveness of medium-term expectations
- the results hold if we add change in uncertainty

Main results (2/2)

Variable	$\Delta\pi^{3Y}$	$\Delta\pi^{3Y}$
$\Delta\pi^{1Y}$	0.29***	
$\Delta\tilde{\pi}^{1Y}$	-	0.26***
<i>Cov</i>	0.11	0.12
<i>demographics</i>	yes	yes
<i>sentiment</i>	yes	yes
<i>country effects</i>	yes	yes
<i>time effects</i>	yes	yes
<i>N</i>	42 218	42 218
<i>R²_{overall}</i>	0.121	0.026

Notes: Random effect estimations with robust standard errors (clustered at country level).

*/**/** denotes statistical significance at 10%, 5% and 1% level.

- medium-term inflation expectations adjust to changes in short-term expected inflation, even after orthogonalizing with respect to perceived inflation ($\Delta\tilde{\pi}^{1Y}$)
- the results hold if we add change in uncertainty

Additional results – asymmetry

Variable	$\Delta\pi^{1Y}$	$\Delta\pi^{3Y}$	$\Delta\pi^{3Y}$
$\Delta\pi^{P+}$	0.38***	0.19***	-
$\Delta\pi^{P-}$	0.38***	0.19***	-
$\Delta\pi^{1Y+}$	-	-	0.29***
$\Delta\pi^{1Y-}$	-	-	0.29***
<i>Cov</i>	0.33***	0.21**	0.11
<i>demographics</i>	yes	yes	yes
<i>sentiment</i>	yes	yes	yes
<i>country effects</i>	yes	yes	yes
<i>time effects</i>	yes	yes	yes
$H_0 : \beta^+ = \beta^-$	0.01	0.04	0.00
p-val.	0.908	0.846	0.981
<i>N</i>	42 218	42 218	42 218
$R^2_{overall}$	0.121	0.026	0.068

Notes: Random effect estimations with robust standard errors (clustered at country level).

*/**/** denotes statistical significance at 10%, 5% and 1% level.

Additional results – cross-country heterogeneity

	BE	FR	DE	IT	NL	ES
	$\Delta\pi^{3Y}$	$\Delta\pi^{3Y}$	$\Delta\pi^{3Y}$	$\Delta\pi^{3Y}$	$\Delta\pi^{3Y}$	$\Delta\pi^{3Y}$
$\Delta\pi^{1Y}$	0.26***	0.30***	0.32***	0.30***	0.27***	0.27***
<i>Cov</i>	0.17	-0.11	0.28***	0.32	-0.21	0.07
<i>demographics</i>	yes	yes	yes	yes	yes	yes
<i>sentiment</i>	yes	yes	yes	yes	yes	yes
<i>time effects</i>	yes	yes	yes	yes	yes	yes
<i>N</i>	4 368	8 179	7 928	9 189	4 072	8 482
$R^2_{overall}$	0.057	0.067	0.097	0.067	0.064	0.072

Notes: Random effect estimations with robust standard errors.

*/**/** denotes statistical significance at 10%, 5% and 1% level.

Results on responsiveness and trust in the ECB institution

Variable	$\Delta\pi^{1Y}$	$\Delta\pi^{3Y}$	$\Delta\pi^{3Y}$
$\Delta\pi^P$	0.40***	0.22***	-
$I \times \Delta\pi^P$	-0.06**	-0.07***	-
$\Delta\pi^{1Y}$	-	-	0.32***
$I \times \Delta\pi^{1Y}$	-	-	-0.07**
<i>Cov</i>	0.43***	0.43***	0.29***
$I \times Cov$	-0.16	-0.34*	-0.27
<i>I</i>	0.01	0.04	0.01
<i>demographics</i>	yes	yes	yes
<i>sentiment</i>	yes	yes	yes
<i>country effects</i>	yes	yes	yes
<i>time effects</i>	yes	yes	yes
$H_0 : \beta + \beta^* = 0$	212.1	39.0	264.6
p-val.	0.00	0.00	0.00
$H_0 : \gamma + \gamma^* = 0$	4.5	0.33	0.02
p-val.	0.03	0.56	0.89
<i>N</i>	40 911	40 911	40 911
<i>overall R</i> ²	0.12	0.03	0.07

Notes: Random effect estimations with robust standard errors (clustered at country level).

*/**/** denotes statistical significance at 10%, 5% and 1% level.

Robustness check with use of qualitative inflation views

- Quantitative vs qualitative inflation views:
 - ▶ Qualitative inflation views more reliable than quantitative? (Pesaran and Weale, 2006)
 - ▶ Qualitative responses not affected by rounding
 - ▶ Changes in qualitative views more important for consumers' economic decisions? intensive margin vs extensive margin of expectations changes (Andrade et al., 2020)
- We test sensitivity of qualitative inflation expectations:
 - ▶ Prices will increase a lot / Prices will decrease a lot / Prices will increase a little / Prices will decrease a little / Prices will be exactly the same (that is 0% change)
- Dependent variable takes one of the three values:
 - ▶ 1 denotes change in qualitative inflation view towards lower prices
 - ▶ 2 denotes no change in qualitative inflation view
 - ▶ 3 denotes change in qualitative inflation view towards higher prices

Results from ordered multinomial logit model

Figure: Effect of change in inflation perceptions

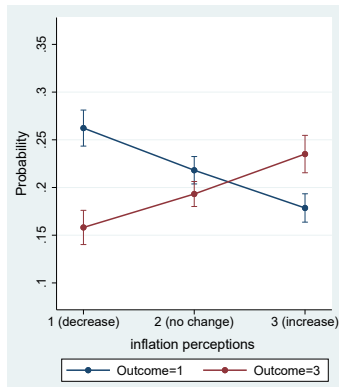
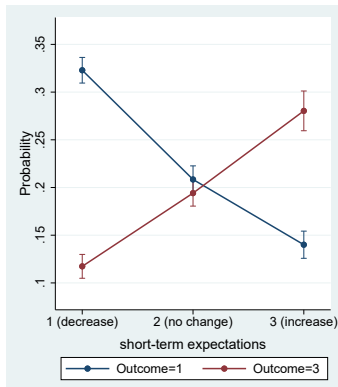


Figure: Effect of change in short-term inflation expectations



Summary and conclusions

Conclusions (1/2)

- We use micro-dataset from novel ECB survey to investigate how euro-area consumers revise their medium-term inflation expectations
- Overall, we find that medium-term inflation expectations adjust to current economic conditions
 - ▶ their responsiveness is lower than responsiveness of short-term inflation expectations
 - ▶ symmetric reaction to increases and decreases in inflation perceptions and short-term inflation expectations
 - ▶ limited cross-country heterogeneity
 - ▶ high trust in the ECB is related to lower responsiveness of inflation expectations

Conclusions (2/2)

- The Covid-19 pandemic contributed to higher inflation expectations
- In line with the finding that consumers do not form expectations consistent with the Phillips curve (Dräger et al., 2016; Ehrmann et al., 2017), or that they interpret inflation as a supply-side phenomenon (Candia et al., 2020)

Thank you for your attention!

Marginal effects based on ordered multinomial logistic regression

	$\Delta\pi^{1Y}$	$\Delta\pi^{3Y}$	$\Delta\pi^{3Y}$
Effects on probability of increase in inflation expectations			
decrease in inflation perception	-0.08***	-0.04***	-
increase in inflation perception	0.13***	0.04***	-
decrease in short-term inflation expectations	-	-	-0.08***
increase in short-term inflation expectations	-	-	0.09***
increase in Covid-19 concerns	0.01***	0.01**	0.01**
Effects on probability of decrease in inflation expectations			
decrease in inflation perception	0.13***	0.04***	-
increase in inflation perception	-0.09***	-0.04***	-
decrease in short-term inflation expectations	-	-	0.12***
increase in short-term inflation expectations	-	-	-0.07***
increase in Covid-19 concerns	-0.02***	-0.01**	-0.01**

Notes: Average marginal effects based on multinomial ordered logit model, in reference to the base levels:

no change in inflation perceptions, no change in inflation expectations, no change or decrease in Covid-19 concerns.

*/**/** denotes statistical significance at 10%, 5% and 1% level.

Additional results – controlling for change in individual uncertainty

Variable	$\Delta\pi^{1Y}$	$\Delta\pi^{3Y}$	$\Delta\pi^{3Y}$	$\Delta\pi^{3Y}$
$\Delta\pi^P$	0.37***	0.18***	-	-
$\Delta\pi^{1Y}$	-	-	0.29***	-
$\Delta\tilde{\pi}^{1Y}$	-	-	-	0.26***
<i>Cov</i>	0.37***	0.28**	0.18***	0.19***
<i>demographics</i>	yes	yes	yes	yes
<i>Δuncertainty</i>	yes	yes	yes	yes
<i>country effects</i>	yes	yes	yes	yes
<i>time effects</i>	yes	yes	yes	yes
<i>N</i>	36 733	36 733	36 733	36 733
<i>R²_{overall}</i>	0.113	0.023	0.064	0.047

Notes: Random effect estimations with robust standard errors (clustered at country level).

*/**/** denotes statistical significance at 10%, 5% and 1% level.