Consumer Inflation Expectations and Local Price Changes

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Abstract

We contribute to empirical literature on the formation of inflation expectations of U.S. consumers by evaluating the extent to which they are affected by local price fluctuations. The results, based on analysis of individual responses within the learning-from-experience framework, indicate that consumer inflation expectations are shaped not only by the national inflation rate but also by experienced local price changes. The impact of local inflation rates is most pronounced among new survey respondents and fades away among repeat respondents. This tenure effect suggests that the expectation formation may shift as consumers become more attentive to inflation news over time. Our findings imply that policy makers should consider both national and local news when assessing consumer inflation expectations, particularly when persistent differences in price developments exist across local communities. They also show that providing consumers with incentives to learn is beneficial in terms of expectation formation, which is a promising result from the point of view of central bank efforts to communicate directly with lay people.

Aim and motivation

- A growing literature stresses the role of consumers' personal experiences among many factors shaping consumers' beliefs
- Local inflation deviates from national one, also over longer periods
- The potential impact of local inflation differences on consumer inflation expectations is relevant from the policy perspective (disagreement)
- We examine whether consumers pay attention to local or national prices while reporting short-term inflation expectations

Contribution

- Carefully matching local data on U.S. inflation expectations and inflation, including data for Census region level and more granular metropolitan area data
- Testing the learning-from-experience model using local data
- Showing that persistent deviations in inflation rates across locations contribute to cross-sectional heterogeneity in consumer inflation expectations
- Identifying tenure effect in expectation formation – inflation expectations of newer respondents more sensitive to local price changes, experienced respondents rely on countrywide factors, including SPF forecasts

Data and model of expectation formation

- Data on consumer inflation expectations (NY Fed SCE) and CPI inflation for 4 U.S. Census regions and 13 metropolitan areas (BLS)
- Model within the learning-from-experience framework (Malmendier & Nagel, 2016): inflation expectations assumed to depend on inflation experienced by consumers in the past
- We allow consumers to learn based on local and countrywide price changes:

$$\pi_{it}^{e} = \beta_0 + \beta_1(\pi_{it}^{l} - \pi_{it}^{n}) + \beta_2\pi_{it}^{n} + \beta_3 SPF_t + \Pi^T X_i + \epsilon_{it}, \quad (1)$$

$$\pi_{it}^{e} = \beta_0 + \beta_1\pi_{it}^{l} + age_i + \delta_t + \Pi^T X_i + \epsilon_{it}, \quad (2)$$

  - ✓ π_{it}^{e} – short-term (+12 months) inflation expectations of consumer i in month t
  - ✓ π_{it}^{l} and π_{it}^{n} – average inflation experienced by consumer i over her lifetime, based either on local or national inflation
  - ✓ in model (1), to avoid multicollinearity between local and national inflation, locally experienced inflation is expressed as a difference from the national one
  - ✓ SPF_t – inflation forecast (+4 quarters) of professional forecasters
  - ✓ control variables: X_i – personal characteristics of consumer i, age_i – age cohort dummies, δ_t – time effects
- Experienced inflation depends on respondent's age and a weighting parameter λ. If λ>0 (λ<0) then consumers put more weight on more recent (distant) observations; if λ=0 then consumers use simple average of past inflation rates
- Following Goldfayn-Frank & Wohlfart (2020) and Kuchler & Zafar (2019) we use grid search to find the weighting parameter λ from the range [-5, 20) with 0.1 step
- In the above model we are interested in long-lasting deviations of local inflation from the countrywide inflation. Additional evidence regarding the importance of short-time deviations based on atheoretical models

Large and persistent gaps between local and national inflation in U.S.

Figure 1. Share of months with large positive deviations (1979-2023)

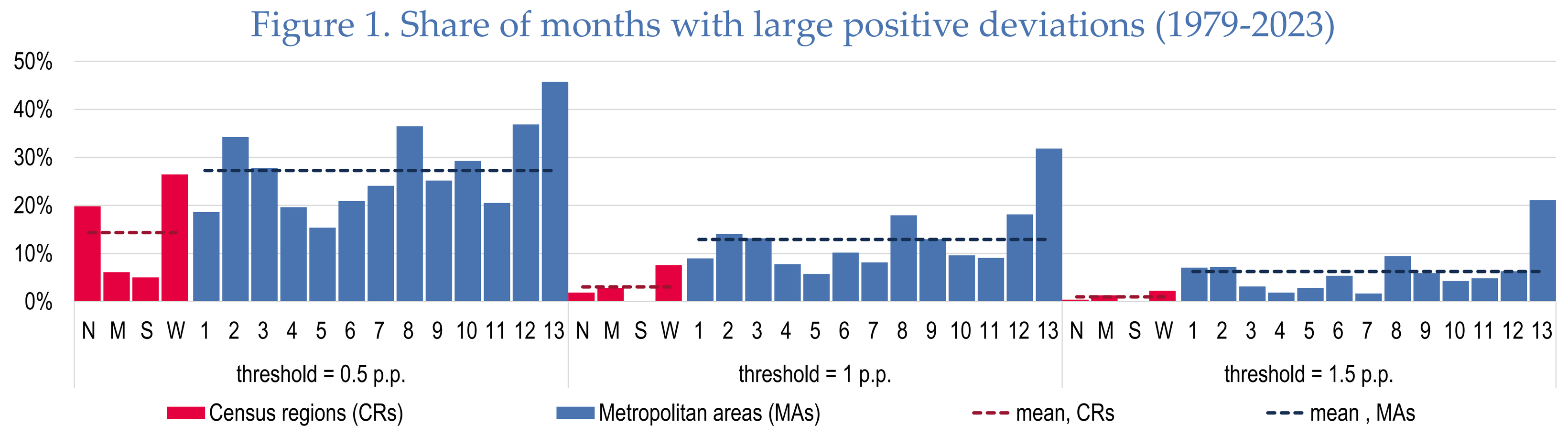
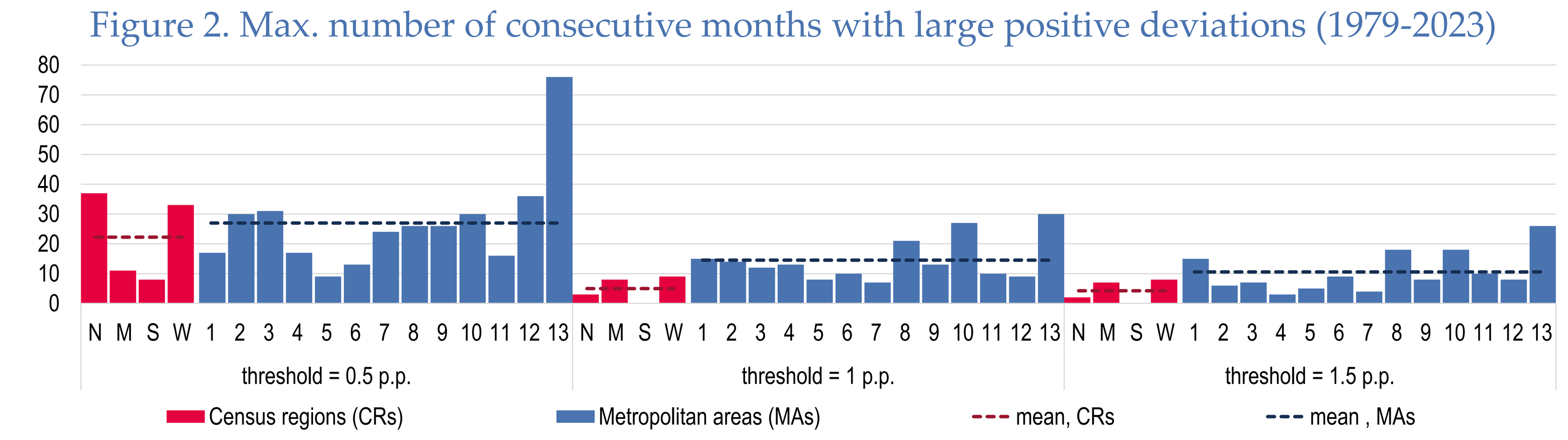


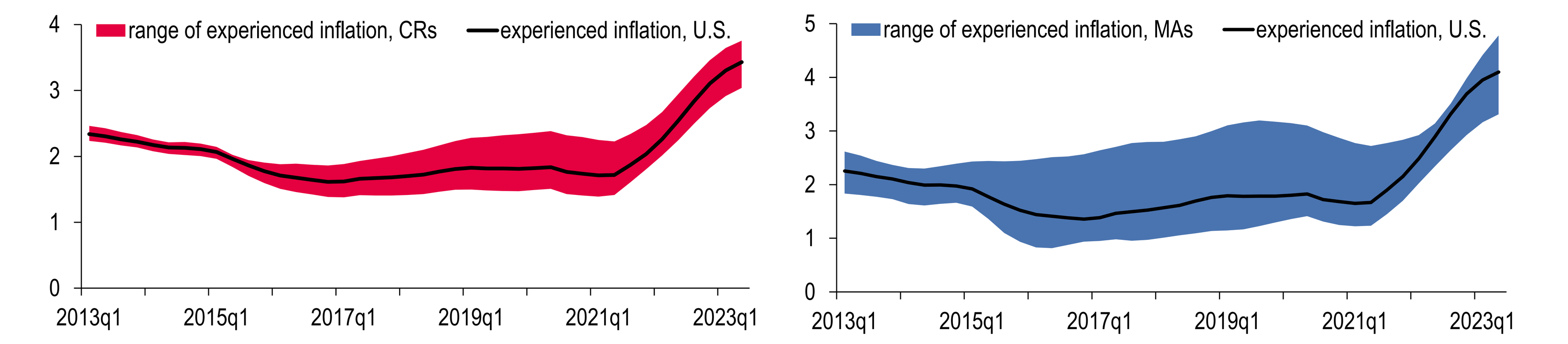
Figure 2. Max. number of consecutive months with large positive deviations (1979-2023)



Heterogeneity of experienced inflation on country and local levels

- Estimating experienced inflation, a positive weighting parameter is found, which implies that consumers put more weight on more recent observations
- Measures of experienced inflation in local communities differ significantly from experienced inflation as measured on the country-wide level – regional differences are lower than in metropolitan areas

Figure 3. Local and country-wide experienced inflation rates



Remarks: experienced inflation calculated over the maximum learning time span and with the best-fitting $\hat{\lambda}$.

Local price changes affect consumer inflation expectations

- Both national and local inflation affect consumer short-term inflation expectations
- The impact of local price developments on inflation expectations is not negligible in quantitative terms
- Expert forecasts also play a role in affecting consumer inflation expectations, but consumers seem to overreact to these forecasts (similarly as in Easaw et al., 2013)
- The results are robust with respect to model specification and the assumptions regarding the age when accumulation of inflation experience starts (0, 10 and 13 years considered)

Table 1. Estimation results of learning-from-experience model

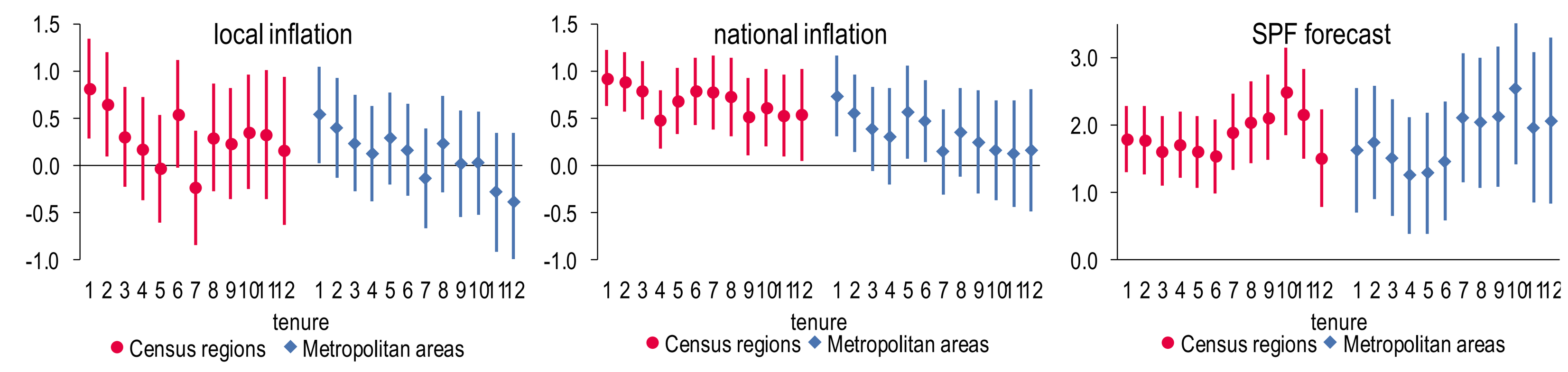
	Model (1)		Model (2)	
	Census regions	Metropolitan areas	Census regions	Metropolitan areas
Local inflation	**0.82*****	**0.54****	**0.57*****	**0.49***
National inflation	0.92***	0.74***	x	x
SPF forecast	1.80***	1.63***	x	x
c	-1.87***	-0.98	18.08***	-2.47
Demographics	yes	yes	yes	yes
Time effects	no	no	yes	yes
Age cohort dummies	no	no	yes	yes
N	8,663	3,055	8,663	3,055
R2	0.038	0.040	0.065	0.072
$\hat{\lambda}$	7.9	9.3	19.9	9.7

Remarks: Calculations based on a sample restricted to new respondents in the panel and assuming that accumulation of inflation experience starts at birth.

New and repeat survey participants

- Estimations for respondents with longer tenures indicate that importance of local inflation diminishes for participants who take the survey multiple times
- The impact of national inflation also weakens, but remains significant for all tenures considered in the case of estimations with regional data
- More experienced respondents learn more from expert forecasts
- A new kind of tenure effect in the formation of consumer inflation expectations

Figure 4. Parameter estimates on subsamples of various tenures



Remarks: Parameter estimates with 95% confidence intervals.

Conclusions

- In setting their expectations consumers are influenced by inflation experienced locally – so far underexplored dimension of expectation heterogeneity
- Policymakers should consider both national and local information when interpreting consumer economic expectations
- Tenure effect in the formation of expectations – local factors less important for more experienced respondents, expert forecasts more important
- Providing consumers with incentives to learn beneficial in terms of expectation formation – a new argument for central banks to communicate with lay people?