Explaining the Inflation Expectations Data from the NY Fed

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February 26, 2023

There are by now many surveys of inflation expectations, surveys of households, firms, and financial market participants. I have reviewed some of these in Section 2 in Fair (2022). The general conclusion from this literature is that inflation expectations of households and firms depend mostly on current and lagged inflation, either actual inflation or perceived inflation. There is virtually no evidence that central bank announcements or guidance play any role. Central banks affect inflation expectations through their effect on actual inflation from contracting or expanding the economy, but not it seems from announcements.

Since 2013 the NY Fed has run a monthly survey of households, asking them for their 1-year-ahead and 3-year-ahead inflation expectations.[1] Let $EXP1_t$ and $EXP3_t$ denote the median expected 1-year-ahead and 3-year-ahead expectations, respectively, where t denotes the month of the survey. One would expect from the literature that these expectations depend on current and past actual inflation, and the purpose of this note is to test this. Let CPI_t denote the percentage change in the headline CPI for month t, seasonally adjusted at an annual rate. Figure 1 plots $EXP1_t$, $EXP3_t$, and CPI_t for the period July 2013 through January 2023.

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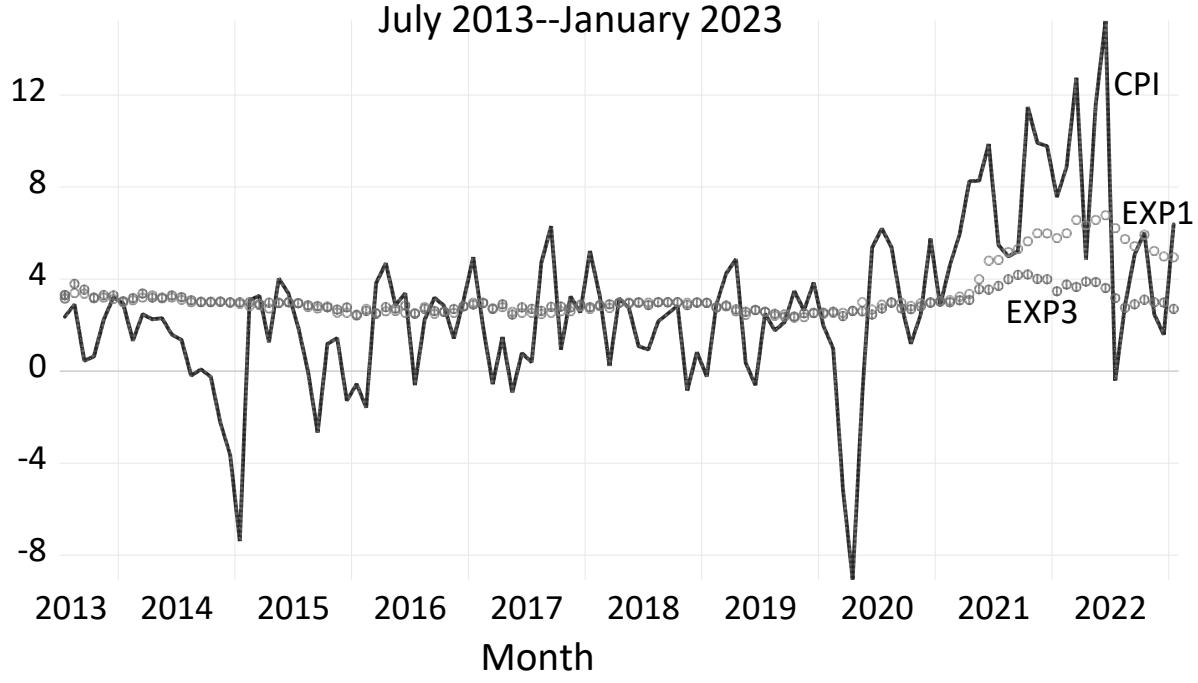
[1]The NY Fed has recently been asking about 5-year-ahead expectations, but there are not yet enough observations to analyze.

Figure 1
Plot of CPI, EXP1, EXP3
July 2013--January 2023



It is clear from this figure that when inflation began to pick up in the beginning of 2021, so did expectations.

Table 1 presents three regressions. For the first $EXP1_t$ is regressed on a constant, its lagged value, and CPI_t. CPI_t has a t-statistic of 5.54. So current CPI inflation and lagged inflation through $EXP1_{t-1}$ affect 1-year-ahead inflation expectations. Even better results are obtained if headline CPI is broken down into core, food, and energy, which is the second regression. There are different effects from the three. For the third regression $EXP3_t$ is regressed on a constant, its lagged value, and CPI_t. CPI_t has a t-statistic of 2.54. In this case breaking up inflation into core, food, and energy did not help.[2]

[2]Unlagged inflation worked better than one-month lagged inflation. So even though $EXP1_t$ and $EXP3_t$ are released before CPI_t, it would appear that households are observing prices

Table 1
Explaining Inflation Expectations
LHS Variable is $EXP1_t$ or $EXP3_t$

	$EXP1_t$		$EXP1_t$		$EXP3_t$	
RHS Var.	coeff.	t-stat.	coeff.	t-stat.	coeff.	t-stat.
cnst	0.138	2.42	0.307	4.57	0.424	3.27
LDV	0.936	50.86	0.841	29.86	0.844	18.71
CPI	0.0324	5.54			0.0129	2.54
core			0.0442	4.45		
food			0.0309	4.59		
energy			0.0021	4.13		
SE	0.189		0.177		0.170	
R^2	0.974		0.977		0.826	

- Estimation period: July 2013–January 2023.
- LDV–lagged dependent variable, either $EXP1_{t-1}$ or $EXP3_{t-1}$.
- $EXP1_t$ = median expected 1-year-ahead inflation expectation.
- $EXP3_t$ = median expected 3-year-ahead inflation expectation.
- CPI = percentage change in headline CPI seasonally adjusted at an annual rate.
- core = percentage change in core CPI seasonally adjusted at an annual rate.
- food = percentage change in food component of CPI seasonally adjusted at an annual rate.
- energy = percentage change in energy component of CPI seasonally adjusted at an annual rate.

These results suggest that expectations can be explained fairly well by current and past actual inflation. Note that during the period of rising expectations, beginning in 2021, the Fed did not change its announcements about its goal of 2 percent inflation. The guidance did not change. Expectations rose anyway because inflation rose. If expectations begin to subside, this will likely be due to actual inflation subsiding rather than Fed announcements.

throughout the month before the CPI is released. Seasonally adjusted CPI data worked better than non seasonally adjusted.

I have argued in Fair (2022) that the Fed's only real tool in fighting inflation is contracting the economy. Without also an announcement or anchoring tool, fighting inflation is harder and takes longer. In Fair (2021) it is shown that in my US macroeconometric model a 1.0 percentage point increase in the short term interest rate lowers inflation by a little less than 0.5 percentage points after five quarters. (Fed announcements and guidance play no role in the model.) This estimate does not take into account any possible stock price reaction to Fed behavior. It is not possible to estimate a systematic relationship between changes in short term interest rates and changes in stock prices, but if there were a fall in stock prices from the increase in the interest rate, this would lower inflation somewhat more than 0.5 (and also output). Some experiments I have run where a large sustained fall in stock prices is imposed suggest a number around 0.7, reflecting large wealth effects in the model. This, of course, is made up since there is no estimated relationship between interest rates and stock prices used.

Inflation as measured by the percentage change (annual rate) in the GDP deflator was 3.9 percent in the fourth quarter of 2022. Other things being equal, if the Fed wanted to lower inflation by 1.5 percentage points to 2.4 percent, this would require a short term interest rate increase of 3.0 percentage points for five quarters according to the model. (One half point fall in the inflation rate for every one point rise in the interest rate.) The current federal funds rate is 4.75 percent, so this would be a rise to 7.75 percent.[3] If this policy were in fact required of the Fed to get inflation down, the policy would clearly be phased in. The Fed would likely still be raising interest rates into 2024.

It is, of course, rarely the case that other things are equal in macro. Many things affect aggregate demand and thus inflation, and if the Fed carried out the above policy, the actual inflation rate after all was phased in could be either higher or lower than 2.4 percent.

[3] If there were a sustained fall in stock prices and 0.7 is used, the increase in the short term interest rate would need to be 2.1 percent.

References

[1] Fair, Ray C., 2021, "What Do Price Equations Say Abaout Future Inflation," *Business Economics*, 56, 118–128.

[2] Fair, Ray C., 2022, "A Note on the Fed's Power to Lower Inflation," *Business Economics*.