Turkish Survey of Expectations: Methodological Changes and Sample Fixing[1]

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Abstract

This paper documents recent changes we made in the methodology of the Turkish Survey of Expectations. In particular, we introduce a novel approach to measure individual uncertainty about medium term inflation expectations. Our findings suggest that disagreement among participants is higher and more volatile than average individual uncertainty, and hence it is the main factor in the dynamics of total uncertainty. Moreover, we develop a fixed subsample of forecasters chosen with respect to their response rates. Results show that the subsample fails to significantly improve forecast performance over trimmed mean.

Keywords: Uncertainty; disagreement; survey data; inflation expectations.

1. Introduction

As an identity, one can decompose total uncertainty in the economy into disagreement among individuals -the dispersion in point forecasts- and sum of individual uncertainty. Because total uncertainty is an unobserved variable, in the lack of a proper measure, disagreement can play an important role in serving as a proxy for uncertainty. Starting with seminal papers Zarnowitz and Lambros (1987) and Bomberger (1996), many researchers have discussed empirically whether disagreement can speak for uncertainty or not, and there exists mixed evidence in the literature. Along with these two papers, Giordani and Söderlind (2003), for example, is in favor of this proxy while D'Amico and Orphanides (2008) claims the opposite and Boero et al. (2008), Rich and Tracy (2006) and Hülagü and Şahinöz (2012) provides mixed evidence.

This paper documents recent changes we made in the methodology of the Turkish Survey of Expectations. In particular, we introduce a novel approach to collect data and measure individual uncertainty about medium term inflation expectations. Even though several surveys like Survey of Professional Forecasters of Philadelphia Fed collect density forecasts, thanks to low inflation environment, similar fixed interval density questions might not work for emerging countries, where inflation is high and volatile. This is why density questions should be asked according to respondent's point forecast. In Turkish Survey of Expectations, survey participants first report their point forecasts about important macroeconomic variables including inflation, exchange rate, interest rate, growth and current account deficit. In addition to point estimates, a window full of probability boxes appears when they submit their annual inflation expectations for 12-month and 24-month ahead (see Figure 1). On the horizontal axis, they see intervals which are computed with respect to their point forecast. On the vertical axis, total number of boxes represents the total probability of that the participant expects inflation to be within that interval. They are asked to fill a total of ten boxes where each box represents 10 percent probability.

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Our findings suggest that disagreement among participants is higher and more volatile than average individual uncertainty, and hence it is the main factor in the dynamics of total uncertainty. This finding empirically supports the usage of disagreement as a proxy for total uncertainty, which is in line with the results of Bomberger (1996). Finally, we develop a fixed subsample of forecasters chosen with respect to their response rates. The main aim is to avoid the adverse effects of nonresponse. Results show that the subsample fails to significantly improve forecast performance over full sample.

2. Methods

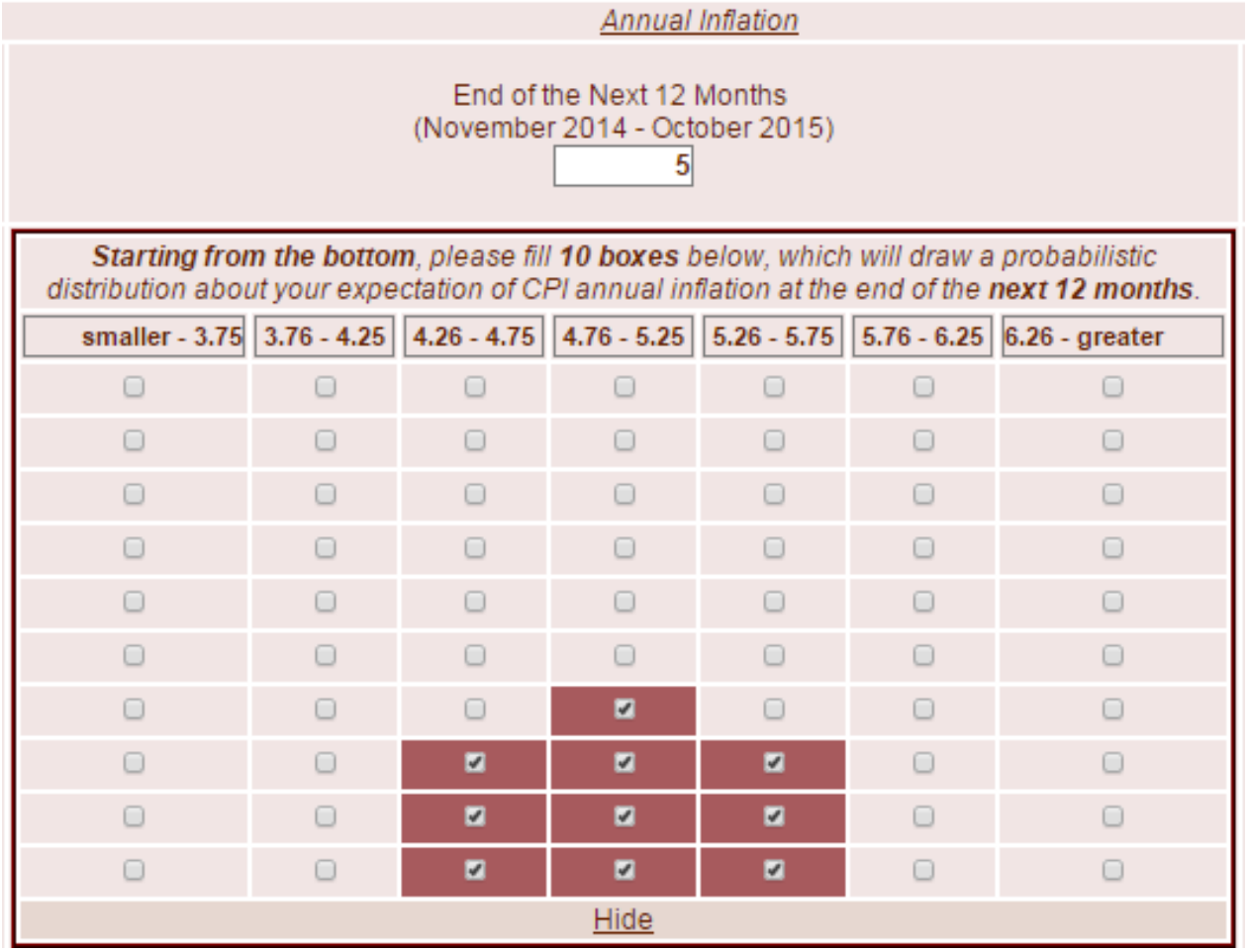
After submitting their point forecast about annual inflation, participants can draw a probabilistic distribution in 7 intervals, as depicted in Figure 1. Individual prediction calculated by:

$$IP_{it} = P_{it,1} * MP_{it,1} + ... + P_{it,7} * MP_{it,7} \tag{1}$$

where P_{it} is the probability pertained to the first interval, MP_{it} is the its midpoint and IP_{it} is the individual prediction of participant i.
Then, we calculate individual uncertainty by:

$$IU_{it} = P_{it,1} * (MP_{it,1} - IP_{it})^2 + ... + P_{it,7} * (MP_{it,7} - IP_{it})^2 \tag{2}$$

Figure 1: An example of probability boxes



and the individual uncertainty of participants at time t is calculated as:

$$AU_t = \frac{\sum IU_{it}}{N}. \tag{3}$$

On the other hand, we calculate disagreement by:

$$D_t = \sum (IP_{it} - \frac{\sum IP_{it}}{N})^2 / N. \tag{4}$$

Finally, the total uncertainty as the sum of average individual uncertainty and disagreement among participants:

$$U_t = \sum_{i=1}^{N} (AU_t + D_t). \tag{5}$$

3. Results

Using the Turkish Survey of Expectations data, we compute and draw U_t , AU_t and D_t in Figure 2. As one can observe, the disagreement is the main driver of total uncertainty and hence can be used as a proper proxy. We further test our hypothesis running regressions with constant variance as well as with an ARCH(1) term.

Figure 2: Components of inflation uncertainty

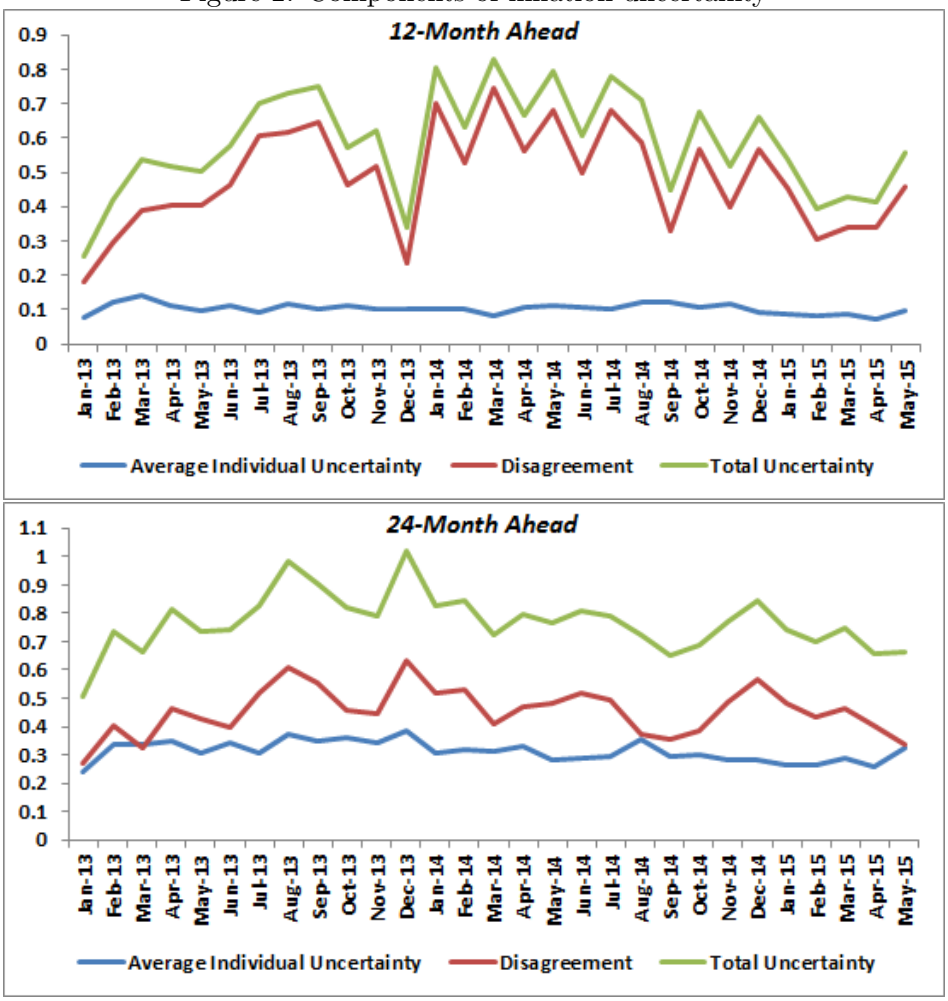


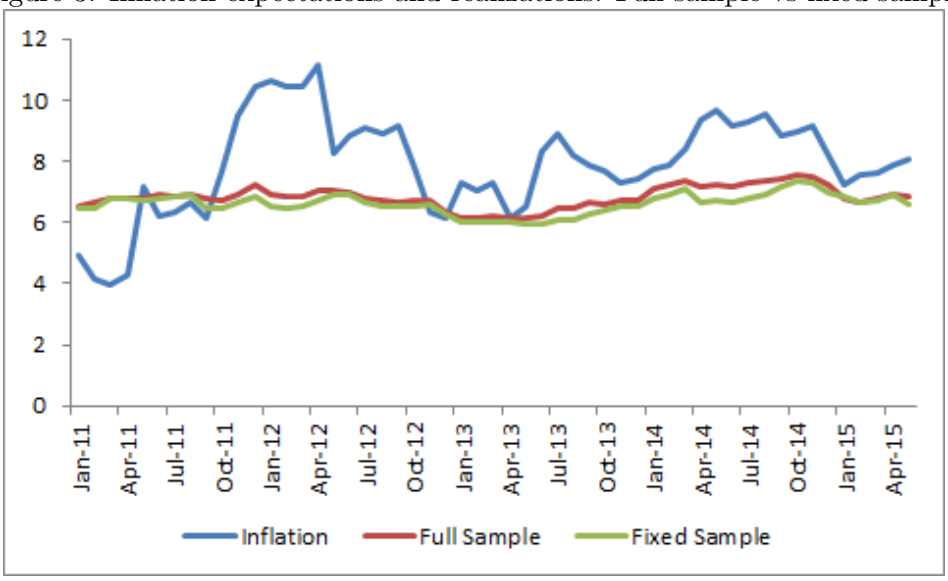
Table 1: Estimation Results for 12-month Ahead Inflation Uncertainty

	(1)	(2)	(3)
U_{t-1}	0.268	0.013	
	(0.170)	(0.020)	
D_t		0.992	1.008
		$(0.022)^{***}$	$(0.018)^{***}$
ARCH(1)			0.747
			(0.547)
Constant	0.440	0.100	0.101
	$(0.103)^{***}$	$(0.014)^{***}$	$(0.010)^{***}$
Adj. R-squared	0.134	0.989	

Notes: (1) Dependent variable U_t is the total uncertainty. (2) The numbers in parenthesis are standard errors while (***) denotes significance at 1% level.

According to Table 1, which summarizes our regression results for 12-month ahead inflation uncertainty, we can claim that disagreement is a very fine proxy for Turkish inflation expectations data.[2]

Figure 3: Inflation expectations and realizations: Full sample vs fixed sample



Finally, we use a fixed subsample to avoid bias which might occur due to changes in the respondents. In other words, the nonresponse rate changes in time and this might affect the results. Therefore, a carefully selected set of individuals are pooled in the fixed sample. According to our results in Figure 3, this subsample fails to improve the forecast performance of the whole sample.

4. Conclusions

We have developed a method to collect information about inflation uncertainty that individuals face. By this means, we compute the components of total uncertainty, namely average individual uncertainty and disagreement among participants. We show that the latter dominates the former both in level and variation. Hence, we conclude that disagreement can be used as a proxy for uncertainty for Turkish inflation

[2]The same analysis for 24-month ahead inflation uncertainty yields similar conclusion (results not shown but are available upon request).

expectations data. On the other hand, using the response rates of participants, we construct a subsample and compare its performance. However, it fails to significantly improve upon trimmed mean of the full sample.

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