Methodological explanations

The quantification of the inflationary expectations is conducted within the population survey by the "FusionLab"[1] company based on the answers to the question "How, in your opinion, in what way prices will be changing in the next 12 months in general?" with the following answer options:

- Will be increasing faster than now;
- Will be increasing in the same way as now;
- Will be increasing slower than now;
- Will remain at the current level/ unchanged;
- Will decrease;
- Do not know.

The calculations are made with a use of the quantification probability method by the Berk[2] method.

There are two main assumption in the method used. First is that the inflation estimations have the specific distribution law, and the second is that the responders round their expectations to the answer option from the questionnaire in the range of sensitivity.

It's assumed that the inflationary expectations have the normal distribution. Every agent *i* at time *t* is giving the answer about the future price behavior at time *t+12* (in months) on the basis of a subjective conditional probability distribution:

$$Z_{t+12} = \frac{\Pi_{t+12} - \Pi^{e}{}_{t+12}}{\sigma_{t+12}}$$

where

Π_{t+12} – the current level of inflation,

$\Pi^{e}{}_{t+12}$– the expected level of inflation,

σ_{t+12} – standard deviation.

This distribution is conditional on the information set available to the consumers at time *t*. Along with that it's considered that the responders don't recognize the price changes on the intervals $(-\varepsilon_t;\ \varepsilon_t)$ and $(-\delta_t + \Pi_{t+12}; \delta_t + \Pi_{t+12})$.

The inflationary expectations can be presented as the mathematical expectation of the estimated distribution in the form of the set of equations:

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[1] former "GfK Kazakhstan"

[2] J.M. Berk, 1999. Measuring inflation expectations: a survey data approach. Applied Economics, 31, 1467-1480.

$$RR_{t+12} = 1 - H(Z^1_{t+12})$$
$$ER_{t+12} = H(Z^1_{t+12}) - H(Z^2_{t+12})$$
$$WR_{t+12} = H(Z^2_{t+12}) - H(Z^3_{t+12})$$
$$C_{t+12} = H(Z^3_{t+12}) - H(Z^4_{t+12})$$
$$F_{t+12} = H(Z^4_{t+12})$$

where:

$$Z^1_{t+12} = \frac{\Pi_{t+12} + \delta_t - \Pi^e{}_{t+12}}{\sigma_{t+12}}$$
$$Z^2_{t+12} = \frac{\Pi_{t+12} - \delta_t - \Pi^e{}_{t+12}}{\sigma_{t+12}}$$
$$Z^3_{t+12} = \frac{\varepsilon_t - \Pi^e{}_{t+12}}{\sigma_{t+12}}$$
$$Z^4_{t+12} = \frac{-\varepsilon_t - \Pi^e{}_{t+12}}{\sigma_{t+12}}$$

$H(Z)$– the function of the normal distribution,

RR_{t+12} – the proportion of responders that expect prices to rise faster;

ER_{t+12} – the proportion of responders that expect prices to rise the same way;

WR_{t+12} – the proportion of responders that expect prices to rise slower;

C_{t+12} – the proportion of responders that expect prices to remain unchanged;

F_{t+12} – the proportion of responders that expect price to fall in the coming year.

It was assumed in the calculation that the responders are familiar with the information about the current level of the inflation, which is published monthly by the Committee on statistics of the Ministry of the national economy of the Republic of Kazakhstan at the moment of participating in survey and share their estimates in comparison with that value. That means that the actual value of the inflation "the month against the corresponding month of the last year", recorded in the month that is prior to the month when the survey takes a place, is used in the calculations.

Along with that, the proportion of the responders, who didn't give an answer to the question about the future inflation (i.e. "do not know" in replying), is distributed proportionally to the other answers.