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Assessing the Anchoring of Inflation Expectations in Kazakhstan

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Assessing the Anchoring of Inflation Expectations of the Population in Kazakhstan.

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Abstract

In this study, we assessed the degree of anchoring of inflation expectations of the population and professional analysts in Kazakhstan since the introduction of the inflation targeting regime. The anchoring was assessed using non-structural methods. Additionally, the rationality of inflation expectations as an indicator of confidence in the central bank was evaluated.

Overall, the results of the study showed that household inflation expectations are unanchored, and the degree of anchoring has decreased in recent years, reflecting sensitivity to short-term fluctuations in macroeconomic indicators. Inflation expectations of professional analysts are also not anchored; however, the degree of anchoring of their expectations is higher than that of the population.

Key Words: inflation expectations, anchoring, inflation.
JEL-Classification: E31, E19, D84

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CONTENTS

1. PREAMBLE

Anchored expectations represent a key aspect of an effective monetary policy. The objective of the central bank of a country is to maintain inflation expectations of business and the households at a stable level close to a long-term inflation goal.

The importance of the anchoring of inflation expectations within inflation targeting lies in the fact that they are one of the factors in shaping future price dynamics. If inflation expectations are anchored, then the deviations of inflation from its target will be less pronounced, and the comeback of inflation to its target will be faster. In this case, the central bank does not have to react to short-term supply shocks and other events thus allowing it to be more flexible.

The monetary policy goal is to avoid either low or high inflation expectations. If businesses anticipate high inflation, they may raise the existing product prices to offset higher production costs in the future. Otherwise, consumers who expect prices to fall may reduce their spending, increasing disinflationary pressure on prices as a result of reduced demand.

Anchored inflation expectations should not change frequently and should be stable over time. The degree of anchoring of inflation expectations can be measured by the degree of sensitivity to new information. If firms and households do not adjust their expectations in response to economic news, this may be the result of anchored inflation expectations and an effective monetary policy (Kose, 2022). In general, the most common approach is that inflation expectations are anchored if they are close to the central bank's long-term goal, their volatility is reduced, and unforeseen shocks have a less sustainable impact in the long run.

The degree of anchoring also depends on institutional factors. Such key factors as the central bank's independence, transparency of its policy, monetary instruments, and a sustainable fiscal policy are the basis for confidence in the monetary policy pursued (Bems et all., 2021)[3]. Moreover, a systematic failure to achieve inflation goals leads to the unanchoring of inflation expectations (Beckmann et all., 2022, Mishkin, 2000).

According to a survey of central banks conducted by the Bank for International Settlements (BIS, 2016), the most important determinants for the formation of inflation expectations are the indicators of past inflation and the level of its volatility. In addition, such nominal indicators were mentioned as the nominal effective exchange rate, base interest rate, growth rate of nominal wages, and the real ones – the unemployment rate, the level of production as well as the central bank's independence and the existence of inflation targeting regime.

Anchored expectations help reduce the inertia of inflation, limit the degree of the pass-through effect from depreciation of the national currency onto domestic prices. This allows the monetary policy to focus more on smoothing out fluctuations in output and increasing resilience to adverse external shocks (IMF, 2018).

[3] For example, (Bems et all., 2021) found higher degree of anchoring in the countries with fiscal rules, higher levels of monetary policy transparency and the central bank's independence

In general, inflation expectations can provide valuable information, even though inflation forecasts are subject to essential errors. A part of the forecast errors is related to the unpredictability of future shocks, and inflation expectations often react to shocks with a significant lag. Even when there are material forecast errors, inflation expectations can still contain useful information, such as the direction of future inflation or how anchored inflation expectations are.

This study examines expectations of various economic agents: households (monthly FusionLab survey commissioned by the National Bank of Kazakhstan) and professional analysts (Consensus Economics) with the use of non-structural methods in the assessment.

In general, the results of various approaches demonstrate a low degree of anchoring of inflation expectations. Inflation expectations of the population are unanchored and irrational, while the degree of anchoring has decreased in recent years. Weak anchoring reflects sensitivity to short-term fluctuations in macroeconomic indicators, fluctuations in monthly inflation in particular. In addition, the sample shows the increased sensitivity of inflation expectations to exchange rate shocks over time. Inflation expectations of professional analysts at Consensus are also weakly anchored, although in some periods they were close to inflation targets and, in general, their degree of anchoring is higher than that of the population.

2. LITERATURE REVIEW

Approaches to the Definition of Anchoring

There is no single definition in the literature for the "anchoring" of inflation expectations and no consensus regarding which indicator inflation expectations should be linked to.

The most common approach is that inflation expectations are considered anchored if they meet the central bank's inflation targets over an extended period of time. It is believed that longer-term expectations/forecasts (from 5 to 10 years) reflect the behavior of economic agents in setting wages and prices in a better way (Bernanke, 2007). In addition, long-term expectations (from 3 years and above) do not reflect the impact of temporary shocks and the reaction of monetary policy (Bems et al., 2021).

A central bank can have a direct or indirect influence on three parameters that allow determining the degree of anchoring of inflation expectations over time: level, volatility and stability.

For example, a central bank can influence the level by declaring a quantitative inflation target. This, in turn, indirectly lowers volatility of expectations by reducing the uncertainty about the central bank's objectives. Additionally, volatility and stability of expectations could be reduced if the central bank adjusts the nominal interest rate more drastically to stabilize inflation near the target. If investors expect the central bank to act decisively on shocks, they may assume that the effects of these shocks will attenuate soon and set prices accordingly. As a result, inflation expectations will be less responsive to external shocks (Doh T., 2018).

Based on that, there are mainly three parameters of anchoring (linking) of inflation expectations in the literature (Łyziak and Paloviita, 2017):

1) Sensitivity of inflation expectations to current inflation (to macroeconomic shocks);
2) Response of longer-term expectations to short-term expectations;
3) Impact of the inflation target and the central bank's forecast on inflation expectations.

If inflation expectations are anchored, perceptions of future inflation should be close to the target as pursued by the monetary authorities (Demertzis, Marcellino, and Viegi, 2012; Kumar and others, 2015).

Inflation expectations can change in response to news and are an important source of long-term nominal interest rate fluctuations (Bauer, 2015). He used an indicator of absolute deviations in inflation forecasts from the target; an indicator of variability in inflation forecasts over time, and the variance of inflation forecasts by individual forecasters (Capistrán and Ramos-Francia, 2010; Dovern et al., 2012; Ehrmann, 2015; Kumar et al., 2015).

Another criterion for anchoring is the rationality of expectations of economic agents. In this case, people's expectations reflect all available economic information and the confidence in the central bank's actions. Businesses and households view

the shock to wages and prices as temporary, resulting in that the wage growth and inflation quickly come back to the target and expectations remain anchored.

Thus, several approaches to the definition of anchoring have shaped in the literature; in most cases, the researchers use a combination of various definitions and methods.

Methods for Assessing the Anchoring

In order to assess the anchoring of inflation expectations, economists use both structural and non-structural models in their studies. Having a structural model provides a better interpretation of what anchored expectations are than approaches based on the rolling regression of either news or changes from short-term expectations to long-term expectations, (Gurkaynak, Levin, and Swanson (2010), Beechey (2011).

In most works, econometric methods used to assess the anchoring are based on the approach of Łyziak and Paloviita (2017), Ehrmann (2015), where the analysis of the dependence of expectations on actual inflation and the pass-through effect from short-term to long-term expectations is performed. The method of Bomfim, Rudebusch (2000) reflects the relationship between deviations from long-term expectations and the target.

Anchored inflation expectations need to be stable not only at the existing level but also in future forecasts. Hence, some authors look at the distribution of probability of future values in order to observe a change in the degree of anchoring.

The study performed by the Bank of Russia also derives a whole range of parameters based on the international experience. However, the concept of anchoring is used in a more strict way.

For example, Berms (2021) constructed indices for 45 countries that combine all three characteristics of anchoring (proximity of expectations to the inflation goal during a long period of time, stability of average values of expectations, and low variance of expectations).

The IMF study (2018) examined the degree of anchoring of inflation expectations in developing and developed countries. Using the experience gained by other researchers, the authors ranked countries according to the degree of anchoring based on four criteria: variance of inflation expectations, sensitivity to shocks from macro indicators, standard deviation of inflation expectations, and the level of spread between forecasts. Each method can have advantages and disadvantages but these four measures paint a consistent picture for each country.

The authors have come to the conclusion that the degree of anchoring has improved over the past two decades, but there is still heterogeneity in anchoring expectations and instability of long-term expectations in certain countries.

In the same study, the authors conclude that the contribution by a change in long-term inflation expectations to inflation is much larger than in the countries with less anchored expectations (by 0.4 pp per annum on average).

The anchoring of inflation expectations can be also assessed using multidimensional models. In such case, the sensitivity of expectations to shocks

from some macroeconomic indicators is tested. If expectations are anchored, they feebly respond to a shock from macro variables, and vice versa.

Thus, Beechey et al. (2011) studied the impact of the lack of a clear inflation target in the communication strategy on long-term inflation expectations in the US compared to the Euro area. In particular, the authors found that inflation expectations are more anchored if market participants have a consensus on the central bank's long-term inflation target. Conversely, when inflation expectations are not anchored firmly because the private sector is unsure of the central bank's inflation target, long-term inflation expectations of agents are subject to change, as macroeconomic news arrive. Empirical analysis shows that long-term inflation expectations are anchored more firmly in the Euro area than in the US due to the presence of a specific inflation target. Similar results, but for a wider list of countries, were obtained by Demertzis M. et al, 2009. In their work, the authors also tested the extent to which inflation expectations are linked to a specific goal (implicit target) and determined the goal itself for countries without an explicit target.

The publication by Davis J.S. (2014) examined the response of inflation expectations to shocks to inflation expectations, inflation and oil price shocks before and after the introduction of the inflation targeting regime. The authors showed that in a number of countries that adopted inflation targeting in the 2000s, there were significant changes in the response of inflation expectations to shocks to macro variables after the introduction of the targeting regime. No similar change in the behavior of inflation expectations in the control group of countries without an inflation targeting regime was observed. Thus, the study showed that the adoption of inflation targeting regime helped anchor expectations in a number of developed and developing countries.

Another example of the use of multivariate models to assess the degree of anchoring of inflation expectations is given in Dräger L., Lamla M. (2013). In particular, the authors analyze the relationship between short-term and long-term inflation expectations over time. The main finding of this article is that since 1978, inflation expectations have become more robust in the US: the impulse in short-term inflation expectations produces less of response in long-term expectations over time. Thus, the authors of the paper come to the conclusion that the degree of anchoring of inflation expectations among the US population has increased.

Table 1

Various Parameters for Assessing the Anchoring of Expectations

Parameter	Models	Sources
The impact of inflation target and the central bank's forecast on inflation expectations	Vector autoregressions, volatility indicator	Gurkaynak, Levin, and Swanson (2010); Beechey et al. (2011); Grischenko (2022)
Response of longer-term expectations to short-term expectations	Linear regressions	Łyziak and Paloviita (2017); Ehrmann (2015); Dräger L.,

		Lamla M. (2013); Davis J.S. (2014)
Sensitivity of inflation expectations to the current inflation (to macroeconomic shock)	Vector autoregressions; regression with a sliding window;	Beechey et al. (2011); Davis J.S. (2014); Grischenko (2022)

3. DATA

The following different sources of inflation expectations are used in the international practice. These can be surveys (of the households, enterprises, financial analysts), a survey of organizations and experts who specialize in developing macro-parameter forecasts as well as obtaining market estimates based on financial instruments. In addition, in recent years, it is common to obtain estimates using the tools for developing news-based indices or comments using big data tools.

Criterion	Types
Source	• Surveys Market-based financial instruments • Big Data
Type of economic agents	• Households • Enterprises • Financial organizations • Specialized agencies (Consensus, Bloomberg, etc.) and professional analysts

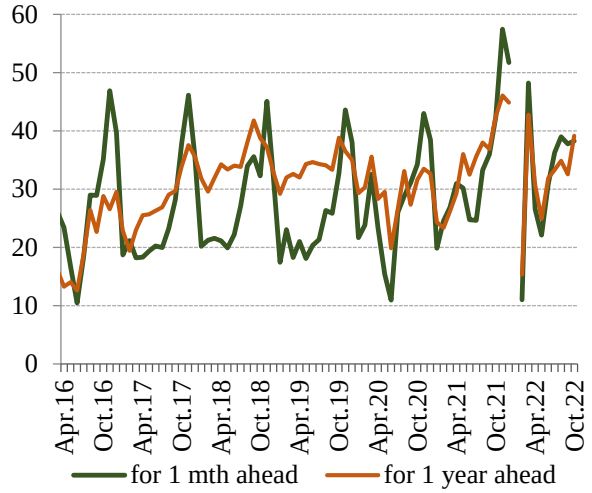
Surveys represent a traditional and most common practice among central banks. According to a study by the Bank for International Settlements, emerging-market central banks increased the number of surveys on inflation expectations between 2009 and 2015, especially inflation-targeting central banks.

Survey methods have advantages in the form of coverage of the main groups of economic agents, while market-based methods have a greater frequency and more horizons for measuring expectations. At the same time, inflation expectations obtained on the basis of inflation-linked financial instruments reflect new information available to market participants in a timely manner.

On average, the expectations themselves and the level of their volatility among households and firms are much higher than the expectations of professional forecasters in both developed and developing economies. For households, past inflation is a strong predictor of expectations; they are more adaptive (back-looking) than professional analysts. At the same time, inflation expectations of professional analysts tend to be closer to the central bank's forecasts (Colibion and Gorodnichenko, 2015). In addition, the volatility of expectations among professional forecasters is below market expectations (Kose, 2022). Households do not know official statistics and often believe in higher inflation rates. In addition, unlike professional analysts, there is more inconsistency in responses of the population. At the same time, the population can generally catch trends in inflationary processes.

This study used the results of public polls (household surveys) in Kazakhstan conducted at the National Bank's request by FusionLab and professional forecasters (Consensus Economics) for Kazakhstan.

Figure 1
Expectations of the Population (Balance of Responses)

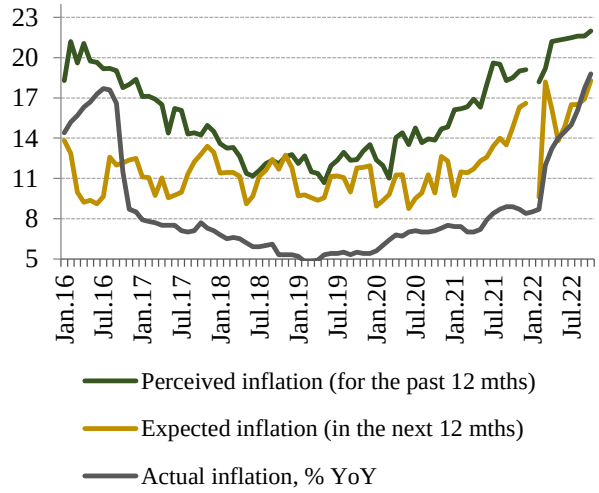


Source: FusionLab, NBK's computations

Figure 2
Enterprise Expectations for a Year Ahead, Balance of Responses

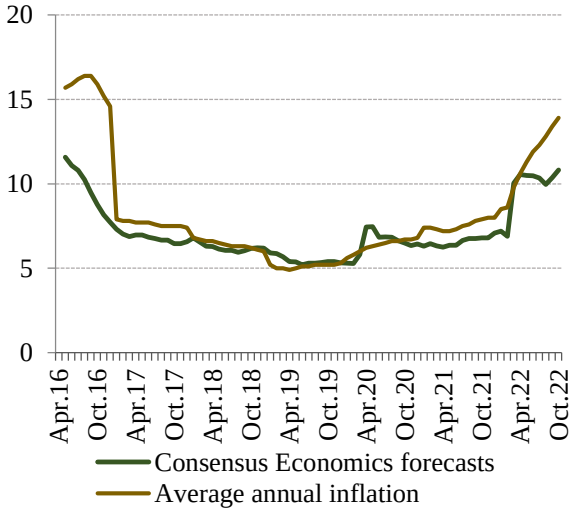
Source: FusionLab, NBK's computations

Figure 3
Expectations of the Population (Median Estimates) for 1 Year Ahead



Source: FusionLab, ASPR BNS, NBK's computations

Figure 4
Expectations of Professional Analysts (Consensus Economics)*



Source: Consensus Economics, ASPR BNS

*Note: Expectations of Consensus Economics have been transformed into moving annual averages

Population surveys on the assessment of inflation expectations commissioned by the National Bank have been conducted since 2016. The surveys involve 1,500 respondents living in cities of national significance and regional centers of Kazakhstan. The survey covers the adult population (18 years and older) with the distribution of the sample by gender, age, employment, nationality according to the official statistics of the Republic of Kazakhstan. The population survey includes qualitative and quantitative questions about the rise in prices in past and future periods, an assessment of financial situation, savings and credit behavior, and

expectations regarding the prospects for the development of the country's economy. In addition, the National Bank's survey on the price growth is conducted as part of the surveys of real sector enterprises. In aggregate, due to the short series of quarterly data, this source was not considered.

The analysis uses both balances of responses to short-term (one month ahead) and medium-term expectations (one year ahead), as well as median estimates of the observed and expected inflation one year ahead. The balance of responses is the difference between proportions of respondents who expect an increase and decline in the indicator. Computation example:1*W (a faster price growth) +0,5*W (the same as now price growth)-0,5*W (price invariance) - 1* W (decline in prices), where W – is the percent of respondents who have chosen the respective answer. The score may vary from -100 (all responses: "will decline") to +100 (all responses: "will be growing faster than now").

The timeframe of data for inflation expectations of the population is from January 2016 through October 2022, and for the Consensus analysts – from May 2016 through October 2022.

To get the one-year forecasts of the Consensus analysts, we transformed the average annual consensus forecasts for two consecutive years and compared them with the average annual inflation. Since the experts give forecasts of average annual inflation every month until the end of the year and average annual inflation for the next year, and in each subsequent month, they know the actual data for the prior months.

In addition, the monthly data on the headline inflation and individual macroeconomic indicators for the period from 2016 through 2022 published on the Taldau information and analytical platform of the ASPR BNS were used[4].

4. RESULTS

Based on the literature review, we have chosen some methods for the anchoring of expectations and have analyzed the results.

1. Sensitivity of Long-Term Expectations to Current Inflation

Assessment of regressive relationship between inflation expectations and current inflation (Ehrman, 2017):

$$E_t(\pi_{t+f}) = \alpha_t + \beta_t \pi_{t-1} + \varepsilon_t \quad (1)$$

where E_t (π_{t+f}) – inflation expectations at time *t* (the median or balance of responses) made for *f* periods ahead, π_{t-1} – actual inflation with the lag of 1 period, ε_t – error. If the expectations are anchored, then the null hypothesis about the insignificance of coefficient βt in the regression cannot be rejected. The rolling regression with a window of 30 periods was evaluated to analyze the changing

[4] The Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan

relationships between variables over time. Rolling regression enables to obtain estimates of regression parameters on a sample interval of constant width sequentially shifted in time. Regression allows building the paths of coefficient estimates along with their confidence bands and test the hypothesis that the coefficients of the regression equation are constant over time. Using a larger sample size or window will result in fewer parameter estimates but more observations. The Newey-West (HAC) standard errors are applied, consistent with heteroscedasticity and autocorrelation.

Because of the January events, the sample was divided into 2 parts: a variant with a sample until 2022 and a full sample with the data replaced by averages (Table 1). Monthly inflation was used as the actual inflation, since significance of annual inflation was considerably smaller. This indicates that the population's expectations are based on the events of the current or preceding month; in general, the picture of the whole year is not included, implicitly confirming the presence of seasonality in the time series of median estimates.

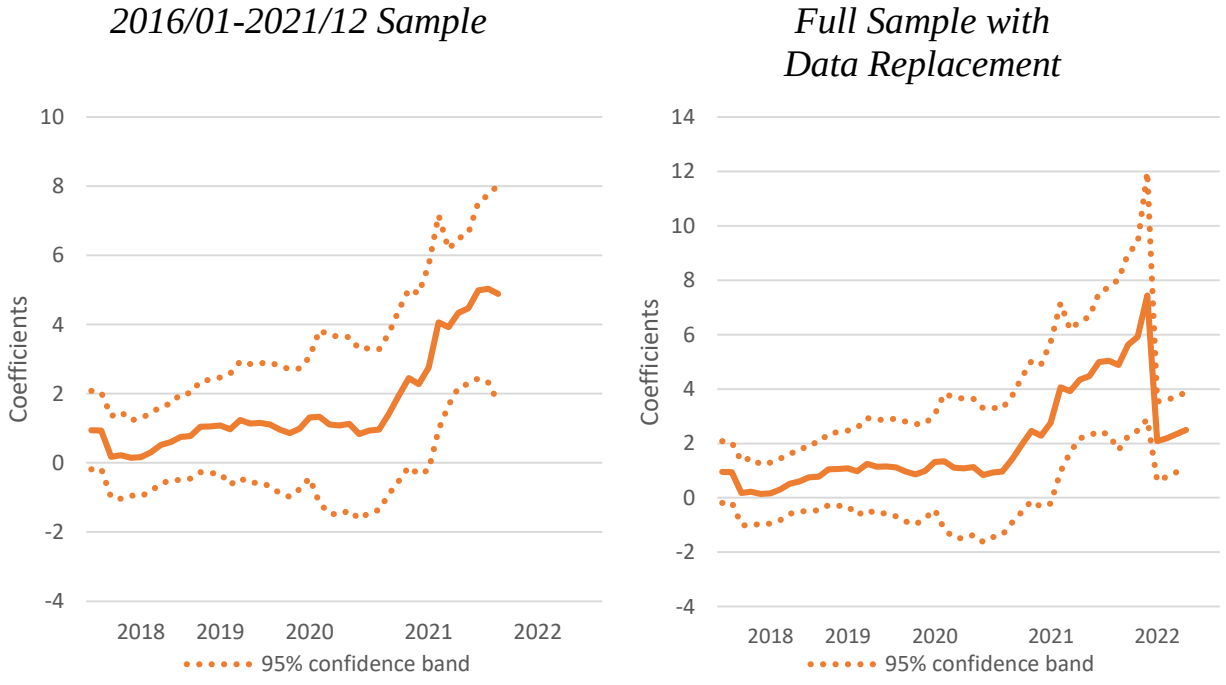
Table 2

Dependence of Inflation Expectations of the Population on Actual Inflation

	Sample 2016/01-2021/12		**Full Sample**	
	β	**Adjusted R**	**β**	**Adjusted R**
Median inflation expectations one year ahead	2.657483 [0.0004]	0.165049	2.596222 [0.0000]	0.336547

Figure 5

Sensitivity of Medium-Term Expectations (One Year) of the Population to the Current Inflation



Note: Rolling regression. Newey-West standard errors. Sliding window = 30 observations. First sample =01/2016 through 05/2018

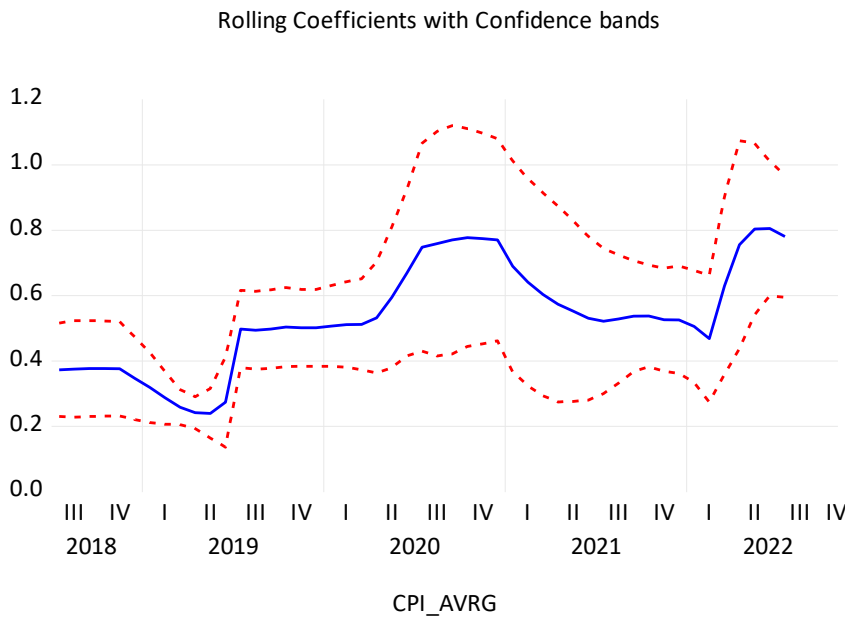
Figure 5 shows rolling coefficient estimates at actual inflation. An analysis of the dynamics of sensitivity of inflation expectations one year ahead to the actual inflation indicates that there are unanchored expectations in both samples, since the coefficient rises over time and becomes higher than one. However, at the beginning of the expectation period, the degree of unanchoring was lower than at present.

As for the forecasts made by the Consensus analysts, the actual average annual inflation is also significant for their expectations (β =0.45, Ad.R2 = 0.780413), while average annual inflation has more significance for them than the monthly inflation.

As in the case of expectations of the population, the degree of anchoring has become smaller in the last three years.

Figure 6

Sensitivity of Medium-Term Expectations (One Year) by the Consensus to the Current Inflation (Average Annual)



2. Sensitivity of Long-Term Expectations to Short-Term Expectations

The sensitivity of long-term expectations to short-term expectations was assessed via regression relationship (Łyziak, Paloviita, 2016). Just as in the study by Grischenko et al. (2022), due to the absence of long-term expectations, sensitivity of short-term expectations of the population (one year ahead) to short-term expectations (one month ahead) was assessed, in the form of a balance of responses:

$$E_t(\pi_{t+f}) = \alpha_t + \beta_t E_t(\pi_{t+m}) + \varepsilon_t \quad (2)$$

where $E_t(\pi_{t+f})$ – long-term (medium-term) inflation expectations in the period t, $E_t(\pi_{t+m})$ – short-term inflation expectations in the period t.

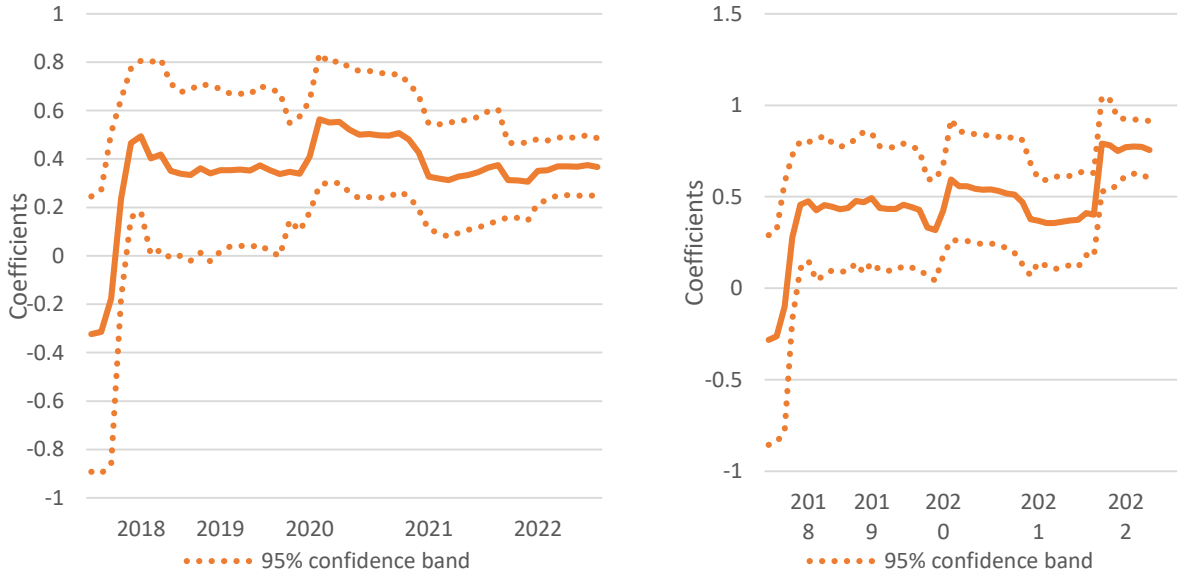
In doing so, given that in January 2022 the data was missed because of the January events, in January-February the averages of the preceding three months were used. In contrast to the initial equation (2), an autoregression component was added into the equation.

The rolling regression was evaluated using a 30-period window. Figure 7 shows the coefficient with the variable of short-term expectations (expectations one month ahead) and its 95% confidence band.

Figure 7

Sensitivity of Medium-Term Expectations to Short-Term Expectations

With replacement of the data *Excl. replacement*



Note: Rolling regression. Newey-West standard errors. Sliding window = 30 observations. First sample =01/2016 through 05/2018

In the period under review, medium-term expectations (one year ahead) depend on short-term expectations (one month ahead). The general dependence of medium-term expectations of the population on short-term expectations is observed almost all the time, while in the initial samples the coefficient was significant only at a 10% significance level. The value of the coefficient increased during the coronavirus pandemic, that is, both medium-term and short-term expectations reacted to the events taking place in the economy in the same way. At the same time, the results indicate that it is impossible to consider the medium-term expectations of the population as anchored.

3. Sensitivity of Expectations to Macroeconomic Shocks

To obtain estimates of the anchoring of inflation expectations in Kazakhstan, a second-order vector autoregression (VAR) model was used, followed by estimates of the impulse response function of inflation expectations for the year ahead to shocks of macro variables. Structural identification of the VAR model was

performed using a recursive short-term identification according to Cholesky. The choice of an optimal lag was made based on the Akaike criterion.

The model in its general form is presented as follows:

$$y_t = \sum_{j=1}^{p} A_j \cdot y_{t-j} + B_t x_t + C d_t + \varepsilon_t, \qquad (3)$$

where y_t – k-dimensional vector of endogenous variables, x_t – vector of exogenous variables, d_t – vector of dummy variables, A_j, …, A_p, B_t, C – matrices of coefficients to be estimated, ε_t – residual vector.

To evaluate the model, we used the data from the beginning of the surveys on inflation expectations, that is, from January 2016 to September 2022. In doing so, to assess the change in the degree of anchoring, the regression was evaluated on a sliding window of 30 observations (Grischenko, 2022).

The following endogenous variables were used in the model:

- Median estimate of the expected inflation one year ahead (EXP_MED);
- Nominal effective exchange rate index (NEER);
- Consumer price index (CPI), deseasonalized;
- A proxy of the output gap (OGPROXY) – a percentage deviation of a short-term economic indicator (SEI) from the Hodrick-Prescott filter trend (λ = 14400).

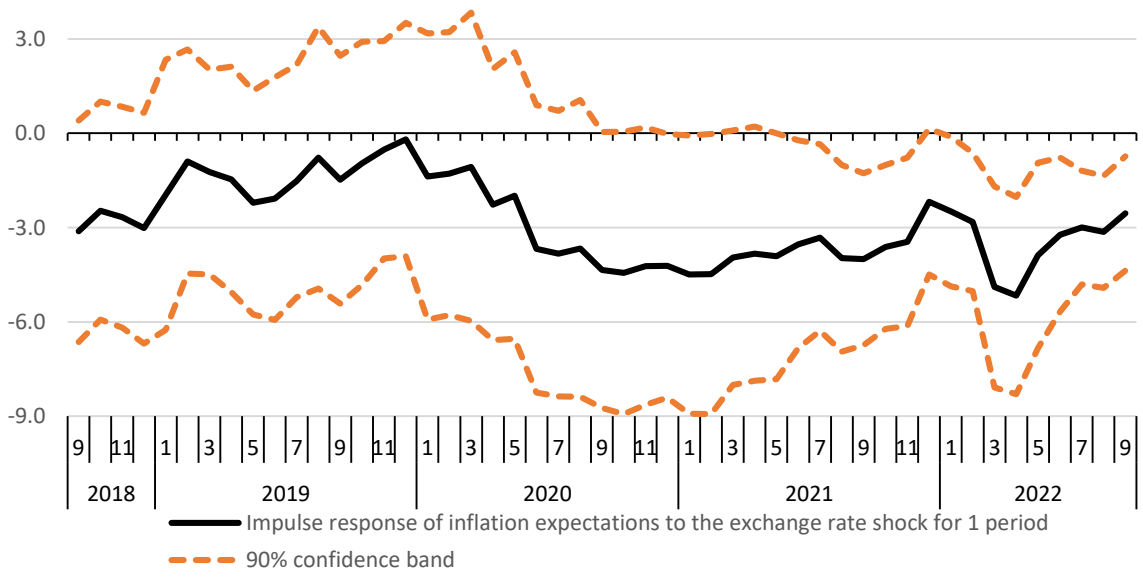
Exogenous variables:

1. Dynamics of Brent oil prices (OIL). The inclusion of this indicator is stemming from a high share of fuel resources in Kazakhstani exports and significant dependence of the dynamics of the tenge exchange rate and the output gap on conditions in the oil market.

2. Inflation in Russia (CPI_RU). Due to a high share of consumer imports from Russia, inflation in Russia exerts significant effect on the pricing within the country.

Figure 8

Reaction of Inflation Expectations to the Exchange Rate Shock



Thus, it is assumed that in the case of anchoring, the impulse responses of inflation expectations to shocks of other macrovariables are not significant. However, as a result, the responses of inflation expectations to the nominal effective exchange rate shocks turned out to be significant in some periods (Figure 8). At the same time, the sensitivity of inflation expectations increases over time. Such reaction of expectations to the exchange rate shocks speaks in favor of reducing the degree of anchoring of household expectations.

4. Proximity of Inflation Expectations to the Inflation Goal

Proximity to the goal was evaluated similarly to the study by Grischenko et al. (2022), IMF (2018), based on the 12-month rolling volatility of expectations (mean root square deviation).

Figure 9

Proximity of Households Expectations to the Goal

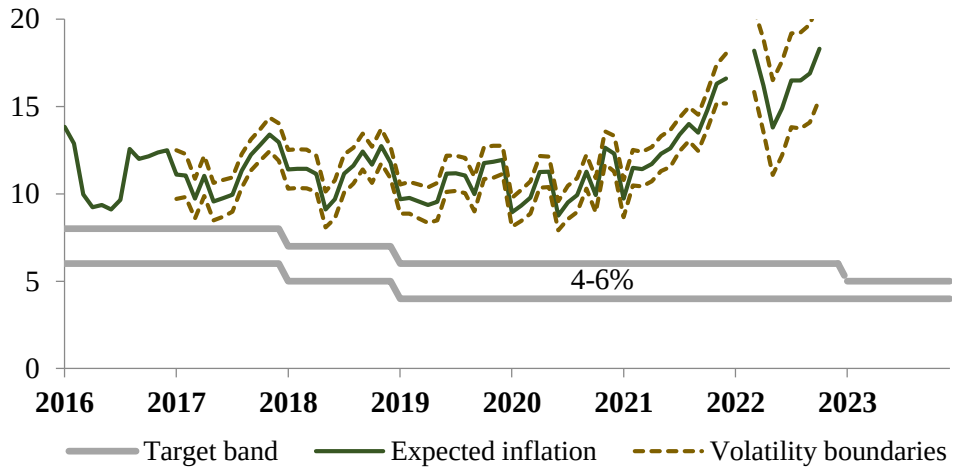
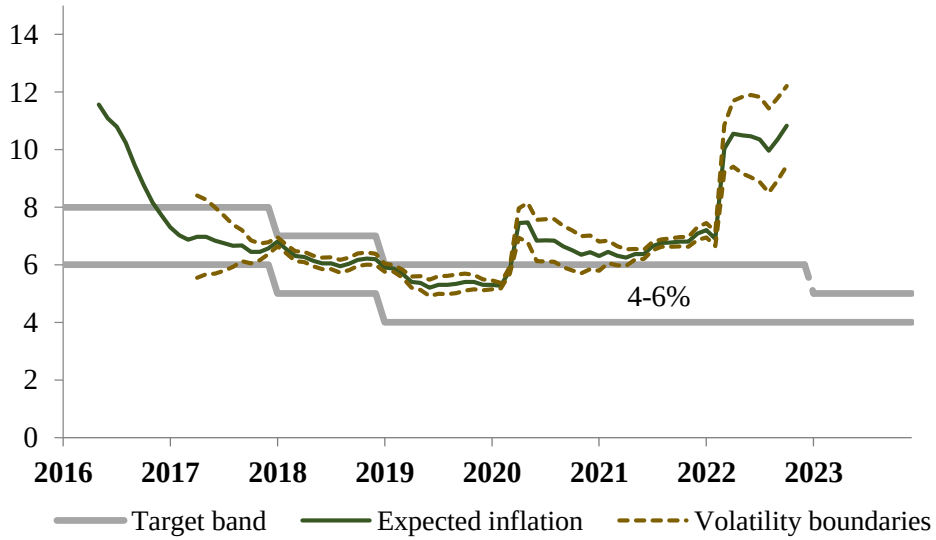


Figure 10

Proximity of Expectations by Consensus Professional Analysts to the Goal



Note: the results should be compared based on that annual averages of expected inflation and the annualized inflation target are compared

Inflation expectations of Consensus analysts were anchored in the period 2017-2019, when annual inflation in Kazakhstan was generally in the target range. Household inflation expectations have remained unanchored since 2016.

The inflation goal in Kazakhstan is formulated on an annual basis. A gradual lowering of inflation targets was announced in 2016 – from 6-8% in 2016-2017 to 3-4% by 2020; further, in 2019 – a gradual lowering from 4-6% to 3-4% by 2025. Economic agents find it difficult to adapt to new numbers, and they may often fail to keep the recurrent shifts of the target bands in their minds. In terms of the anchoring of inflation expectations, it is not desirable to frequently revise the quantitative goals and forms of the target.

At the same time, inflation-targeting countries are beginning to set a permanent medium-term target to be achieved all the time, not at the end of the year. In Kazakhstan, in the context of the transition period, the achievement of the target continues to be measured by inflation at the end of the year, while the emphasis may change in various communications.

5. Assessing Rationality of Inflation Expectations

In this part, we performed a group of tests for rationality of expectations. We added the annual inflation and annual movement of the exchange rate of the tenge against the US dollar.

If the null hypothesis is rejected, then the expectations of economic agents are biased, which does not correspond to the hypothesis of their rationality. The results of the test for unbiasedness of the error of inflation expectations are presented in Table 3.

The test results indicate that the hypothesis of rationality of inflation expectations from professional forecasters (Consensus) and the population is rejected.

Table 3

Tests for Rationality of Expectations

	Criterion	**Equation**	**H0**	Results **Households**	Results **Consensus**
1	Unbiasedness	$\pi_t - \pi^e_{t-12} = \alpha + \varepsilon_t$	$\alpha_t = 0$	α_t= -3.772097 H0 rejected	α_t=0.547424 H0 rejected
2	The use of all information	$\pi_t - \pi^e_{t-12} = = \alpha + \gamma\pi^e_{t-12} + \sum \beta_i X_{it-12} + \varepsilon_t$	$\beta_i = 0$, γ=0	ß(usd/kzt)= 0.027808 ß Cpi = -0.154527 γ= -1.130024 H0 rejected	ß(usd/kzt)= 0.026982 ß Cpi = -0.648304 γ= --2.146913 H0 rejected

5. CONCLUSION

It is paramount for the monetary policy to analyze the dynamics of inflation expectations and the factors affecting them. Expectations represent an important indicator of confidence in a central bank.

In this study, the authors conducted an initial assessment of the anchoring based on Kazakhstani data. However, it is worth mentioning that the analysis of the degree of anchoring of inflation expectations in Kazakhstan must take into account some specific features and limitations of the data (short data series, not all sources of formation of expectations are covered).

Moreover, the absence of estimates for long-term inflation expectations is stemming from the fact that the inflation targeting regime was introduced relatively recently and is at a transitional stage.

Further accumulation and study of the data, including from various sources and categories of economic agents, will provide a basis for setting up communication tools. In addition, this will enable to monitor how the attitude of economic agents to new information and the central bank policy changes over time, to understand the differences between expectations of various agents. It is possible to study the process using alternative structural approaches. The presence of a structural model provides a better interpretation of the anchoring of expectations, however, it certainly also has its limitations.

The process of the anchoring of expectations is slow and time consuming. A longer actual staying of inflation near the target, a better communication policy, openness and transparency of the National Bank of Kazakhstan will help increase the degree of anchoring of inflation expectations. In addition, in the context of inflation targeting, it is also important to pursue a sustainable fiscal policy and, in general, ensure the coherence of macroeconomic policies. What is important is not an in-and-out effect but a complex effect of all possible factors that have influence on the anchoring of inflation expectations.

6. LIST OF REFERENCES

1. Beckmann J., Gern K-J., Jannsen N., Sonnenberg N., Stolzenburg U. Inflation expectations: quo vadis? Policy Department for Economic, Scientific and Quality of Life Policies Directorate-General for Internal Policies, January 2022
2. Bauer Michael D. Inflation Expectations and the News. Federal Reserve Bank of San Francisco. International Journal of Central Banking, March 2015.
3. BIS Papers No 89, 2016 Inflation expectations and monetary policy.
4. Beechey et al. (2011) Are Long-Run Inflation Expectations Anchored More Firmly in the Euro Area than in the United States? // American Economic Journal: Macroeconomics 3. April. http://www.aeaweb.org/articles.php?doi=10.1257/mac.3.2.104
5. Bems R., Caselli F., Grigoli F., Gruss B. Expectations' anchoring and inflation persistence. Journal of International Economics 132 (2021)
6. Economic surprises and inflation expectations. Has anchoring of expectations survived the crisis? Søren Lejsgaard Autrup and Magdalena Grothe. Working Paper Series. NO1671 / April 2014.
7. Carlos A., Medel V. An econometric analysis on survey-data-based anchoring of inflation expectations in Chile* Economia Chilena|Volumen 21, Nº2 | Agosto 2018.
8. Carvalho C., Eusepi S., Moench E., Presto B. Anchored Inflation Expectations. CAMA Working Paper 25/2020, March 2020
9. Davis J.S. (2014) Inflation Targeting and the Anchoring of Inflation Expectations: Cross-country Evidence from Consensus Forecasts / Federal Reserve Bank of Dallas Working Paper # 174
10. Demertzis M., M.Marsellino, N.Viegi. Anchors for inflation expectations. EUI Working Papers, 2010/10
11. Demertzis M. et al. (2009) Anchors for inflation expectations / DNB Working Paper #229. November
12. Dräger L., Lamla M. (2013) Anchoring of Consumers' Inflation Expectations: Evidence from Microdata / DEP (Socioeconomics) Discussion Papers.
13. Doh T. and Oksol A. Has the Anchoring of Inflation Expectations Changed in the United States during the Past Decade? Economic Review (1 quarter 2018).
14. IMF World Economic Outlook. October 2018. Chapter 3. Challenges for monetary policy in emerging markets as global financial conditions normalize. Anchoring of Inflation Expectations, p.127.
15. M. Kose A., Matsuoka H., Panizza U., Vorisek D.Policy Research Working Paper 8785. Inflation Expectations Review and Evidence
16. T.Łyziak and M.Paloviita. Anchoring of inflation expectations in the euro area: recent evidence based on survey data
17. Grischenko V., Kadreva O., Porshakov A., Cherniyadiev D. Assessing the Anchoring of Inflation Expectations for Russia. Research Note, July, 2022.
18. Yevdokimova T. et al. Impact of the Degree of Anchoring of Inflation Expectations and Monetary Policy Transparency on Inflation in the Period of

Instability in the Emerging Markets in the Summer of 2018. Money and Credit, No.3, 2019, pp.71-88

19. Pervyshin Yu.N., Rykalin A.S. Modeling of Inflation Expectations in the Russian Economy