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Development of Inflation Expectations in Serbia and a Comparative Analysis[1]

Abstract: Inflation expectations are very important when it comes to monetary policy and its decisions. In countries which are applying inflation targeting, inflation expectations reflect prediction of economic agents of movement of inflation rate in mid and long term. Anchored inflation expectations and their movements within target tolerance band are pointing to effectiveness of the inflation targeting strategy. Consistent with the best international practice, after introducing the inflation targeting regime in January 2009, the National Bank of Serbia began monitoring and analysing inflation expectations of economic agents (financial sector, corporate sector, trade unions, and households). The aim of this paper is to analyse inflation expectations in Serbia, but also to give a comparative analysis of inflation expectation of other countries which are using inflation targeting and floating exchange rate, as is the case of the National Bank of Serbia.

Keywords: inflation expectations, monetary policy, economic agents, anchored expectations

JEL classification: E31, E52, E58

From the perspective of monetary policy, just as important as the behavior of actual inflation is what households and businesses expect to happen to inflation in the future, particularly over the longer term.

Former Federal Reserve Chairman Ben S. Bernanke
Remarks on Class Day 2008 at Harvard University,
Cambridge, Massachusetts

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[1] The views expressed in the paper are those of the author and do not necessarily represent the official view of the National Bank of Serbia.

1. Introduction

In December 2008, the Monetary Policy Committee of the National Bank of Serbia (hereinafter referred to as: the NBS) adopted the Memorandum on Inflation Targeting as Monetary Strategy, which defines formal implementation of the inflation targeting regime as of 1 January 2009. The inflation target, defined in terms of the annual percentage change in the consumer price index, is the only numerical guideline for the monetary policy implemented by the NBS. The NBS will achieve the inflation target by changing the interest rate applied in the conduct of its main monetary policy operations (currently, the interest rate on one-week repo operations). This interest rate will be its main monetary policy instrument. Other monetary policy instruments (e.g. open market operations, required reserves, lending and deposit facilities (standing facilities) and interventions in the foreign exchange market) have supporting roles, as they should contribute to a smooth transmission of the key policy rate to the market and balanced development of financial markets without threatening the stability of the financial system.

Consistent with the best international practice, after introducing the inflation targeting regime in January 2009, the NBS began monitoring and analysing on inflation expectations of economic agents. The source of data for these purposes is the inflation expectations survey, conducted for the NBS by Ipsos since January 2018. Survey participants are classified into four institutional sectors (financial sector, corporate sector, trade unions and households) and asked to state their expectations for the y-o-y price growth one-year ahead, and as of March 2014, also in the medium-term, i.e. two-year ahead.

The aim of this paper is to present development of inflation expectations in Serbia, with the presentation of methodology and questionnaire which the NBS uses in collecting inflation expectation from four institutional sectors. The paper is divided into following section. The first section is devoted to literature review after which analysis is focused on inflation expectation in Serbia with the comparison of inflation expectation with other countries that apply inflation targeting and floating exchange rate, as is the case of the NBS. The results of the work are summarized in conclusion.

2. Literature review

The degree to which inflation expectations are tied down at long horizons, or anchored is central to many of the key issues in macroeconomics, monetary policy and finance. Bearing this in mind, many authors have dealt with the analysis of

inflationary expectations. According to the Forsells and Kenny (2002) inflation expectations surveys are useful because they provide independent measures of inflation expectations, a key variable that a central bank can use in its design of an optimal monetary policy geared toward the achievement of price stability. Monetary policy influences the cycle not only by directly affecting aggregate demand and supply but also by shaping expectations (Awdeh, 2018). Clark and Nakata (2008) made a difference between the influence of long-run expectations on inflation and the anchoring of inflation expectations and stated that increased stability of inflation and expectations in recent years is largely due to smaller shocks to the economy. It is also important to make distinction between inflation expectation of countries with an explicit inflation target and those which have no such target, like the USA which are using the difference between far-ahead forward rates on nominal and inflation indexed bonds as a measure of compensation for expected inflation and inflation risk at long horizons (Gürkaynak et al. 2010, Sack 2000, Tobias & Hao 2009).

Authors like Roberts (1998) point to the connection between inflation expectations and transmission of monetary policy and emphasize that inflation expectation are not perfectly rational and not as unsophisticated as simple autoregressive models would suggest. Kiley (2008) emphasizes topics which are influenced by the extent of anchoring in long-run inflation expectations and those are the nature of fluctuations in inflation and in the economy more generally, the setting of monetary policy and the behaviour of the term structure of interest rates and other asset prices. One of the main tasks of modern central banks is to build credibility by matching its words (communication) to its deeds. Target rate decisions in the European Central Bank were found to be mostly linked to changes in inflation expectations and central bank communication whereas the Federal Reserve decisions were based on changes in the output gap and communication (Lehtimäki & Palmu 2019).

Burke and Manz (2011) point to two channels through which expectations-formation may vary across individuals: (1) the choice of information and (2) the use of given information. These authors emphasize that subjects who are more economically literate perform better along both dimensions, e.g. they choose more relevant information and make better use of given information. Important part of inflation expectations is that they should be well anchored. Anchoring criteria are empirical estimates of a market implied inflation target as well as the strength of the anchor that holds expectations at the target (Strohsal & Winkelmann 2012). It is important to stress on the difficulties associated with anchoring inflation expectations when policymakers attempt to maintain a high degree of employment stability relative to price stability in an environment where the central bank has imperfect information about the economy (Orphanides & Williams 2011).

Also expectations are tending to acting differently in periods of rising and decreasing inflation. Inflation expectations appear to underestimate inflation during periods of rising inflation and overestimate inflation during periods of falling inflation (Andolfatto et al. 2005). During the 2008 financial crisis, long-run inflation expectations, based on survey-based measures and measures extracted from inflation-linked financial market instruments, have become less firmly anchored (Galati et al. 2009). To achieve better anchoring of inflation expectations central bank should improve communication with general public and for that reason long-run inflation expectations are not as firmly anchored in the United States as in the euro area because ECB's policy communications strategy has contributed to the firm anchoring of inflation expectations in the euro area (Beechey et al. 2009). According to Ullrich (2007), communication can influence inflation expectations twofold. First, the gap between realized and expected inflation can be influenced by the rhetoric of the central bank. Second, the communication could directly influence the expectations formation process. Also if a central bank announce inflation target that helps to anchor inflation expectation on right level (Demertzis et al. 2010). Inflation targeting countries have better anchored expectations and tend to score higher transparency (Cruijsen & Demertzis 2005).

There are important differences in the process of formation of inflationary expectations under pegged and floating exchange rate regimes. In countries with fixed exchange rates, which import the monetary policy stance and credibility of the EA (euro area), formation of inflationary expectations are more exogenous with respect to domestic policies and real sector movements (Ramadani & Pandiloski 2018). Inflation expectations are widely viewed as key determinants of future inflation and long-run inflation expectations are considered a useful gauge of central bank credibility (Christensen et al. 2010). Expectations drive people's behaviour, by influencing a wide range of economic decisions, such as saving, investment, purchases of durable goods, and wage negotiations (Armantier et al. 2012). Inflation targeting may not only affect the level of inflation expectations, but also the dispersion of these expectations across economic agents, because target becomes a focal point for the coordination of expectations among agents (Capistran & Ramos-Francia 2007).

3. Inflation expectations development in Serbia

The inflation expectations survey for the NBS was conducted by Ipsos and Gallup agencies until December 2014, Ninamedia agency from December 2014 till December 2017, and Ipsos agency since January 2018. Survey participants are classified into four institutional sectors (financial sector, corporate sector, trade unions, and

households) and asked to state their expectations for the y-o-y price growth one-year ahead, and as of March 2014, also in the medium-term, i.e. two-year ahead.

For three institutional sectors (e.g. financial sector, corporate sector, and trade unions), according to the Methodology, in the first month of the survey, data were collected through quantitative field research by applying the PAPI method (paper and pencil interviewing) and in the remaining 35 months of the survey, data were collected through quantitative telephone research by applying the CATI method (computer aided telephone interviewing) with the support of CAWI research (as a web questionnaire delivered through a link). The household sector data are collected only by quantitative field research by applying the PAPI method (paper and pencil interviewing). Implementation period for the survey for all four institutional sectors is conducted from the 15th day of the month over the next 5 days and findings are submitted by the 3rd day of the next month at the latest. Based on data from Questionnaire for each of four institutional sectors is prepared list of questions: three questions for financial sector and trade unions, seven for households and nine for corporate sector (*Annex 1*). Since May 2015, the NBS has been publishing data on inflation expectation for all economic agents every month, and that information is available in the "Report on the result of the inflation expectations survey".

Table 1: Expected y-o-y inflation, in %

	Month	Financial sector		Corporate sector		Households		Trade unions	
		12 months ahead	24 months ahead	12 months ahead	24 months ahead	12 months ahead	24 months ahead	12 months ahead	24 months ahead
2018	1	3.00	3.50	3.00	3.00	5.00	6.00	3.50	3.30
	2	3.00	3.00	3.00	3.00	5.00	5.00	3.00	3.30
	3	3.00	3.00	3.00	3.00	5.00	5.00	4.30	3.00
	4	2.50	3.00	2.80	3.00	5.00	5.00	2.80	3.00
	5	2.50	3.00	2.70	2.80	5.00	5.00	3.00	3.00
	6	3.00	3.00	2.70	2.80	5.00	5.00	3.00	3.00
	7	3.00	3.20	2.70	2.80	7.00	5.00	3.25	5.00
	8	2.90	3.00	2.50	2.60	6.00	5.00	3.50	3.75
	9	3.00	3.20	2.60	2.60	5.00	5.00	4.05	5.00
	10	2.80	3.00	2.40	2.50	8.00	7.00	4.50	5.00

Source: National Bank of Serbia

According to the data for first ten months of 2018, inflation expectations of the financial sector and the corporate sector in 12 and 24 months ahead and those

of trade unions for 12 months ahead are in line with inflation target, which is set at the level of 3%, with a tolerance band of ±1.5 percentage points. Based on the „National Bank of Serbia's Memorandum on Inflation Targets Until 2020" inflation target is set on that level up to 2020. Households` inflation expectations for 12 and 24 months ahead are above the upper limit of inflation target (e.g. 4.5%) and trade unions` inflation expectations for 24 month ahead in July, September and October 2018 are above the upper limit of inflation target. Based on information from the Report on the result of the inflation expectations survey for October 2018, the majority of respondents (67.8%) in the households sector expect prices to rise moderately or somewhat over the next twelve months, which is somewhat lower value compared to September 2018 (73.5%). (*Table 1*)

In October 2018, the Report on the result of the inflation expectations survey indicated that the short-term and mid-term inflation expectations of the financial sector and corporate sector were lower than in September and continued to move within the target range (3 ± 1.5%). The financial sector expected inflation of 2.8% one year ahead, while expected inflation in two year ahead is at the central target of 3.0%. Inflation expectations of corporate sector are somewhat lower and amount to 2.4% for the year ahead and 2.5% for two years ahead (*Graph 1*). The inflation expectations of trade union representatives remained unchanged at 5.0%, while the mid-term inflation expectations of the households increased (for the first time since January 2018) and amount to 7.0%.

Figure 1: Current inflation and one-year ahead inflation expectations (y-o-y rates, in %)
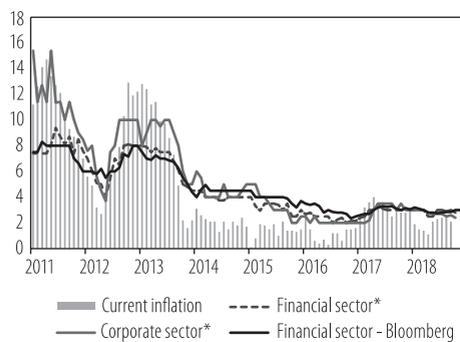
Note: * Ipsos and Gallup agencies until December 2014, Ninamedia agency from December 2014 till December 2017, and Ipsos agency since January 2018.

Source: Gallup, Ipsos/Ninamedia, Bloomberg and NBS

In Inflation report for November 2018, the NBS stated that preserved price stability in the past five years and the confidence of the financial and corporate sectors in the measures taken by the NBS contribute positively to the expectations regarding economic growth. Firmly anchored inflation expectations are one of the prerequisites for achieving low, stable and predictable inflation. The fact that inflation expectations in Serbia are well anchored confirms the credibility of the NBS measures and indicates the absence of major inflationary and disinflationary pressures.

4. Comparative analysis of inflation expectations

For conducting comparative analysis of inflation expectations we choose the central banks of Poland, the Czech Republic, and Hungary. The reason why we select these countries is that all of them implemented inflation targeting and floating exchange rate, as is the case of the NBS.

The National Bank of Poland (hereinafter referred to as: the NBP) since 1998 has been pursuing direct inflation targeting. Since the beginning of 2004, the continuous inflation target has been standing at 2.5% with a permissible fluctuation band of +/- 1 percentage point. This means that every month, annual CPI should be as close as possible to 2.5%.

The NBP examines inflation expectations of various groups of agents: consumers, enterprises and professional forecasters. The data comes from surveys: Poland CSO (Statistical Office) Consumer opinion survey (*Graph 2*), NBP Quick Monitoring (enterprises) and NBP Survey of Professional Forecasters. The data is updated on quarterly basis. Inflation expectations of households and enterprises are based on data which are included in a balance statistics, defined as a weighted difference between fractions of respondents expecting rise in prices and fractions of respondents expecting no change or fall in prices: $B = (E1 + \frac{1}{2}E2) - (\frac{1}{2}E4 + E5)$, where E1, E2, E4 and E5 denote, respectively, fractions of respondents claiming that prices will increase more rapidly, or that they will increase at the same rate, stay the same or fall.

For households, the survey question is formulated as follows:

"By comparison with the past 12 months, what changes in consumer prices (of consumer goods and services) do you expect in the next 12 months? (1) there will be a faster rise, (2) there will be a rise at similar rate, (3) they will rise at slower rate, (4) they will stay at similar level, (5) there will be a fall, (6) don't know."

The survey question for firms is formulated as follows:

„In … [month, for which the latest data is available] of the current year, the CPI (inflation) was equal to x% in annual terms. In the enterprise's opinion, during the next 12 months prices: (1) will rise faster than by x%; (2) will rise at the rate of x%; (3) will rise more slowly than by x%; (4) will remain unchanged; (5) will fall; (6) don't know".

Figure 2: Balance statistics of Consumer inflation expectations
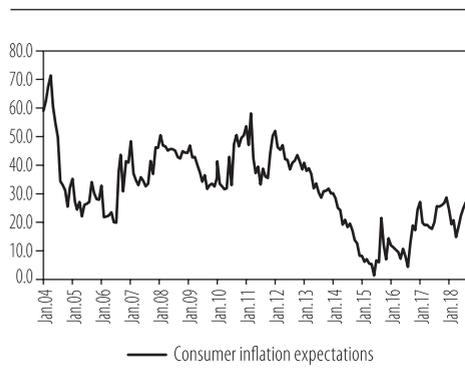
Source: NBP calculations based on CSO data

The NBP Survey of Professional Forecasters aims at collecting macroeconomic forecasts of various groups of professional forecasters. Inflation expectations of the participants to the NBP Survey of Professional Forecasters reflect the median probability distribution obtained from the aggregation of probability forecasts of the experts surveyed by NBP. It is directed at analysts of the financial sector, representatives of universities and scientific institutes as well as experts of employee and employer organizations. The survey is conducted on a quarterly basis: in March, June, September and December.

The inflation projection is prepared by the Economic Analysis Department of the NBP and presents a forecast of economic developments under the assumption of constant NBP interest rates. The projection is prepared three times a year and is published in March, July and November in the fourth chapter of the Inflation Report. The projection covers economic developments up to three years ahead from the publication date. According to the projection published on November 2018 CPI inflation for 2018 is set at level of 1.8% yoy, for 2019 3.2% yoy and for 2020 2.9% yoy. In October 2018, CPI inflation stood at 1.8% yoy.

The Czech National Bank (hereinafter referred to as: the CNB) from the start of 1998 implemented inflation targeting, as official monetary strategy. The inflation target set in terms of headline inflation of 2% with effect from January 2010 until the Czech Republic's entry to the EA. The CNB will strive to ensure that actual inflation does not differ from the target by more than one percentage point in either direction. Inflation targeting also includes inflation forecasts which are published in the CNB's Inflation Reports. The CNB also conducts surveys of inflation expectations of households, non-financial corporations and firms and financial markets.

The CNB conducted survey on inflation expectations in household sector in period from June 1999 till March 2007 for one-year horizon and in the period from December 2002 till March 2007 for two years ahead. Survey is carried out on quarterly basis (March, June, September and December). According to the Methodological Sheet, households are contacted by employees of Ecoma Plus, a market

research company. The group of respondents included 600 households chosen randomly, which created a representative sample with respect to sex, age, education, job, number of persons and children in household. Households, managers and traders are being asked the following questions:

- *What year-on-year consumer price change in per cent do you expect in the next 12 months?*
- *What year-on-year consumer price change in per cent do you expect in the period of 36 months?*

Inflation expectations of managers of non-financial corporations and companies for the one-year horizon are available on quarterly basic from June 1999, while for three-year horizon data are available from December 2002 (*Graph 3*). Inquiry is carried out with non-financial corporations and firms quarterly in March, June, September and December by means of e-mail questionnaires. Managers are contacted by the CNB. The group of respondents includes 118 senior managers of industrial, construction, trade and service firms, which create a representative sample of the main sectors of the economy.

The CNB started with regular measurement of inflation expectations on the financial market in May 1999 in order to monitor and assess changes in the predictions for inflation, GDP, wages and financial market indicators (*Graph 4*). The aim of the survey of analysts is to get respondents` views on the expected evolution of macroeconomic indicators and to compare their expectations with the CNB's forecast. The set of respondents is made up of analysts from large banks and brokerage companies who are highly active on the money and capital markets and who agreed to assist the CNB. Data are available on quarterly basic (March, June, September and December) from June 1999, both for one-year and three-year horizons.

Inquiry is carried out monthly by means of standardized questionnaires. Traders are contacted by the CNB. The group of respondents includes 14 analysts from seven Czech companies and seven foreign entities, which create a representative sample of traders highly active in these segments and hence price setters on the market for various instruments.

Inflation expectations for non-financial corporations and companies, as well for financial market, are anchored in range of inflation target (e.g. 2% +/- 1 p.p.) for one and three year horizon. This indicated that monetary policy is credible and that non-financial corporations and companies and financial market expect stable inflation within its target range. In October 2018 inflation is at the level of 2.2% yoy.

Graph 3: Inflation expectations of managers of non-financial corporations and companies (in % CPI yoy)
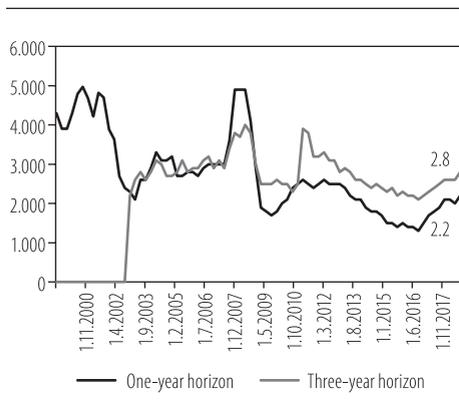
Graph 4: Inflation expectations of financial market (in % CPI yoy)
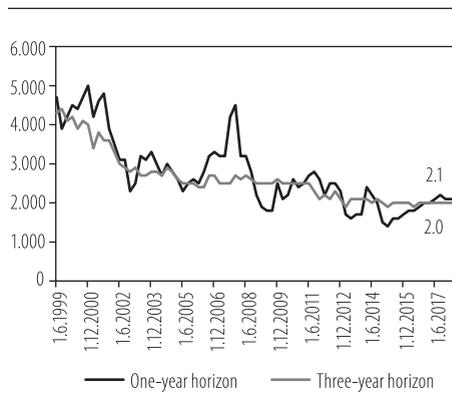
Source: Czech National Bank

The Hungarian central bank, *Magyar Nemzeti Bank* (hereinafter referred to as: the MNB), implements inflation targeting system since the summer of 2001 in line with its primary objective to achieve and maintain price stability. From March 2015 inflation target is defined at the level of 3% ±1 percentage point.

The MNB collect inflation expectations of professional forecasters, households and firms and data are derived from surveys based on quantitative or qualitative questionnaires (*Table 2*). The advantage of quantitative surveys is the fact that the questionnaire includes a direct question about a relevant variable for the monetary policy (i.e. the quantified value of future inflation).

Based on information from Gábriel et al. (2014) two surveys are available for domestic analyst expectations: (1) Consensus Economics polls Hungarian and foreign financial and economic analysts in respect of their expectations. Short-term (current and next year) and long-term (five and ten-years ahead) expectations are published with a monthly and a semi-annual frequency, respectively. More than 180 analysts (international and CEE) are interviewed in respect of their expectations about the Central and Eastern European region and (2) the Reuters survey asks 20–25 market analysts on a monthly basis about their inflation expectations for the current year and for the next two years. Both quantitative and qualitative surveys are used to gauge the inflation expectations of households.

Table 2: Available measures of inflation expectations

Economic agent	Data source	Horizon	Frequency	Other
Professional forecasters	Reuters	current and next calendar year	monthly	international
	Consensus Economics	current and next calendar year	monthly	international
		long term (5-10 years)	semi-annually	
Households	European Commission	quanlitative, 12 months	monthly	international
	Medián/Tárki	quanlitative, 12 months	quarterly	publicly available results are limited to a few countries
Firms	European Commission	3 months	monthly	international
	Medián/Tárki	quanlitative, 12 months	quarterly	on a global scale, corporate surveys are rare

Note: Medián-Market is Research company in Hungary and Tárki is Social Research Institute in Hungary

Source: Gábriel P., Rariga J. and Várhegyi J. (2014). Inflation Expectations in Hungary, MNB Occasional Papers 113, p. 7

In the context of the quantitative survey aimed at Hungarian households' inflation perceptions and expectations, 1,000–1,200 persons are polled. The following questions are asked in respect of inflation expected one year from now:

How do you expect consumer prices will develop in the next 12 months? Will they decrease, increase or remain the same? In your opinion, by what percentage will prices increase / decrease? In respect of long-term expectations, the survey uses the following question: What annual rate of inflation do you expect five years from now?

The expectations of firms play a role in price-setting and wage negotiations and as such, can exert a substantive impact on the evolution of inflation. Medium-term corporate inflation expectations can be computed from the Tárki/Medián survey. The question is quantitative, directly asking about the future level of inflation expected by firms (12 months ahead).

The MNB publish data for inflation expectations for Hungary and countries in the region (Czech Republic, Poland, Romania, and Slovakia) and those data are available in Inflation report, in section Macroeconomic overview (*Graph 5*).

Figure 5: Inflation expectations in the region
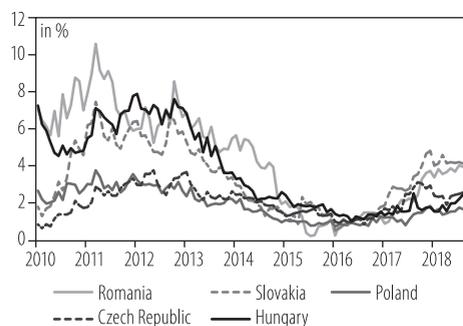
Source: MNB calculations based on European Commission data

In Inflation report for September 2018 the MNB stated that Hungarian households' inflation expectations remain at moderate levels, indicating anchored expectations. These expectations were in line with the expectations observed in the countries of the region, which were characterized by steadily low inflation in the past as well.

Conclusion

This paper focused on inflation expectations in Serbia and a comparative analysis in countries which are using inflation targeting and floating exchange rate, same as the NBS. Inflation expectations are one of the most important channels whereby monetary policy influences the entirely economic activity. A highly credible central bank can anchor medium to long-term inflation expectations around the inflation target. Also, if inflation expectations are firmly anchored, any temporary shocks to inflation would not persist for long, thereby making the task of monetary policy easy.

With all analysed central banks inflation, expectations are well anchored for almost all economic agents (e.g. financial sector, trade unions, professional forecasters, and corporate sector). The only sector whose inflation expectations deviate from official inflation target and actual inflation is households. This might be because of households' inaccurate assessment of macroeconomic developments in general, and inflation trends in particular. The anchor of inflation expectations points to credibility of monetary policy of each analysed central bank and indicates the absence of major inflationary and disinflationary pressures.

The inflation expectations of economic agents are relevant for central banks for two main reasons. First, inflation expectations can provide direct information concerning the credibility of monetary policy. Second reason is that inflation expectations carry important information that can help central banks in forecasting macroeconomic developments. Taking into account that short term demand

and supply effects (e.g. increasing VAT or commodity prices) are the main reasons of changing the level of inflation rate, expectations have the dominant role in determining inflation in the long term.

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Annex 1

QUESTIONNAIRE OF INFLATION EXPECTATIONS SURVEY IN SERBIA

Note: c stands for current month.

Financial sector

According to your information, what is the year-on-year inflation rate in c-1, that is, consumer price growth in c-1 relative to c-13?

What year-on-year rate of inflation do you expect in c+12 (consumer price growth in c+12 relative to c)?

What year-on-year rate of inflation do you expect in c+24 (consumer price growth in c+24 relative to c+12)?

Corporate sector

What are your company's expectations regarding costs of production inputs:

in the next 3 months (increase, no change, decrease)
in the next 12 months (increase, no change, decrease)

What are your company's expectations regarding prices of final products/services you provide:

in the next 3 months (increase, no change, decrease)
in the next 12 months (increase, no change, decrease)

What are your company's expectations regarding movements in production/trade:

in the next 3 months (increase, no change, decrease)
in the next 12 months (increase, no change, decrease)

What are your company's expectations regarding movements in stocks of raw materials in the next 3 months? (increase, no change, decrease)

What are your company's expectations regarding movements in stocks of final products in the next 3 months? (increase, no change, decrease)

According to your information, what is the year-on-year inflation rate in c-1, that is, consumer price growth in c-1 relative to c-13?

What year-on-year rate of inflation do you expect in c+12 (consumer price growth in c+12 relative to c)?

What year-on-year rate of inflation do you expect in c+24 (consumer price growth in c+24 relative to c+12)?

According to your expectations, over the next 12 months your company's investment in fixed assets will:
increase, remain unchanged, decrease

Trade unions

According to your information, what is the year-on-year inflation rate in c-1, that is, consumer price growth in c-1 relative to c-13?

What year-on-year inflation rate do you expect in c+12 (consumer price growth in c+12 relative to c)?

What year-on-year inflation rate do you expect in c+24 (consumer price growth in c+24 relative to c+12)?

Households

According to your estimate, over the past 12 months consumer prices have:
1) increased considerably; 2) increased moderately; 3) increased somewhat; 4) remained unchanged; 5) decreased; (6) I do not know.

What is your estimate of the annual increase in consumer prices in (c-1) relative to (c-13)?

According to your expectations, in the next 12 months consumer prices will:
(1) increase considerably; (2) increase moderately; (3) increase somewhat; (4) remain unchanged; (5) decrease; (6) I do not know.
By how much do you expect consumer prices to increase in (current month, current year+1), relative to (current month, current year)?

In the period of 12 months thereafter (from (current month, current year+1) until (current month, current year+2), do you expect prices to:

(1) increase considerably; (2) increase moderately; (3) increase somewhat; (4) remain unchanged; (5) decrease; (6) I do not know.

By how much do you expect consumer prices to increase in (current month, current year+2) relative to (current month, current year+1)?

Would you like to explain the reasoning behind your reply?