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Inflation Expectations: Importance and Measurement

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Inflation Expectations: Importance and Measurement

Executive Summary

Inflation describes the process of sustained price increases for a wide range of goods and services. Thus, inflation originates from decisions by enterprises to increase the prices for their goods and services. When taking such decisions, enterprises do not only take into account the past development of prices and costs (such as wages, input prices, rents), but also their expected increase in costs and prices in the near future. In such a way, inflation expectations become a key determinant of inflation itself. This phenomenon, which also applies to wage setting, is the main culprit for the own dynamics inflation can develop through "second round effects".

This insight has deep consequences for the conducting of monetary policy and for fighting inflation in general. In order to combat inflation it is not sufficient to restrain current monetary and fiscal policy; the authorities have also to target inflation expectations and try to influence them in a positive way. Only when inflation expectations are anchored, the authorities will be able to achieve price stability. This is particularly true for the NBU as the central bank, but extends equally to other branches of government. Any measure to be implemented to fight inflation (e.g. a more restrictive social or wage policy) should be announced well in advance to impact expectations and thereby directly inflation.

But since inflation expectations are not directly observable, it is necessary to measure expectations using a certain methodology. Two main methods are frequently used: either derived from surveys (direct method) or through inflation-linked bonds (indirect method). Indirect methods cannot be implemented in Ukraine as of today, because of the non-existence of inflation-linked bonds. Consequently, the NBU will have to focus on direct methods for the time being. Concerning direct methods, there are a number of surveys for measuring inflation expectations currently in place in Ukraine. In our view, the methodology of existing surveys should be improved, as all have their own peculiarities. International experience offers some important insights for such improvements. While the sectoral coverage should be gradually broadened (stressing the importance of household respondents), also the expectations horizon need to be enlarged. While short-term expectations, as they are currently collected, are an important information indicator, also expectations over longer horizons should be collected in addition. Longer term expectations are an important element in most international surveys, as they capture the perceived credibility of the central bank, and entail therefore important additional information. Also the way such different survey data are collected, monitored and presented to the public could be improved. Here, the NBU could take the lead and conduct a comparative analysis of all available surveys and communicate the results to the public.

The present paper makes a first attempt to analyse inflation expectations on the basis of simple correlation analysis. Here, some interesting leading indicator properties of the survey performed by the IER could be identified. However, based on the improvement in methodology and the availability of longer data series, we recommend the NBU to conduct a systematic research on expectations. This includes the concrete formation mechanism, the relationship of expectations with realised inflation, and its reactions to policy actions. The results of such applied scientific research could then be used in an active manner by the NBU to anchor inflation expectations, analyse its perceived credibility and thus contribute to price stability. The future shift to inflation targeting as a monetary policy framework will likely increase the need for such measures, as central bank credibility and the management of inflation expectations are key elements in such a framework.

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1. Introduction

One reason why policy makers and especially central banks monitor inflation expectations is that they are an important element in determining short-run inflation dynamics. If they are not firmly anchored, they can become self-fulfilling and a dangerous wage-price spiral can develop which is only at large economic cost to contain. The current surge in inflation in Ukraine to levels above 31% makes this issue more pressing, as second-round effects from food and energy-driven supply shocks are likely to materialize if inflation expectations are not being stabilized.

This shows clearly the importance of inflation expectations for policy makers, and especially for the NBU as the central bank. While short-term expectations show immediate future price pressure, long-term expectations are also an important indicator for the perceived credibility of the NBU by economic agents. This has also implications for appropriate anti-inflation policies: in case the central bank is believed to be credible, less tightening of policy might be sufficient, while a weak central bank needs to tighten more to affect inflation expectations. Other stakeholders in the economy (government, firms, and consumers) also benefit from more information on inflation expectations. However, since expectations are not directly observable, they need to be measured, following certain methodologies. International practice offers several ways to do this. The present paper contributes to this by summarizing the different approaches and recommending policy options for Ukraine, taking into account current practices in the country.

The paper is structured as follows: Part 2 provides a short overview of the crucial role that inflation expectations play in standard macroeconomic models of the inflation process. Approaches to measure inflation expectations in developed and emerging markets are explained in Part 3. The current practice in Ukraine is shown in Part 4. Part 5 concludes with policy recommendations.

2. The role of inflation expectations in the inflation process

Expectations of inflation play an important role in the theoretical modelling of inflation dynamics. In many standard models of the inflation process, e.g. the expectations-augmented Phillips curve, short run inflation is linked to a measure of real economic activity (like the output gap or the unemployment rate) and expected inflation. In this sense, expected inflation influences already inflation today. The standard channel of influence is that higher inflation expectations may cause workers to demand higher nominal wages (trying to keep their expected real wage constant), giving rise in turn to higher prices. Furthermore, in a situation in which practically everyone expects inflation to rise, firms may indeed be more willing to accept wage increases. Under an inflationary environment, high wage costs can easily be passed on to consumers in the form of higher output prices.

More recent work using a dynamic New Keynesian macroeconomic framework has put the importance of inflation expectations for inflation dynamics on more rigorous microeconomic foundations[1] which relate e.g. to optimal price-setting strategies by firms operating under imperfect competition. A key implication of such models is that inflation is determined in a forward-looking manner, driven in part by its own expectations.

Turning to Ukraine, a crucial source of high and growing inflation could indeed be found in the price setting process. As a lot of markets in Ukraine feature some kind of monopolization, prices are frequently set using mark-ups over marginal costs of the firms. The determination of the mark-up level depends to a large extent on inflationary expectations of firms, both in the production and retail sectors. If firms are forward-looking in their pricing strategy, and expect that future inflation remains high (driving their marginal costs further up), they can embed

[1] See for an overview Clarida/Gali/Gertler (1999): The science of monetary policy: A New Keynesian perspective, Journal of Economic Literature 37, pp. 1661-1707.

their inflationary expectations already in current mark-ups, increasing current prices [2]. Moreover, if firms are monopolists on certain local/niche markets, they can increase mark-ups based not only on expected inflationary dynamics of their future marginal costs, but on perceived inflationary expectations of consumers. In other words, if firms realize that consumers expect higher prices for most goods and that they consequently are ready to pay higher prices, in the short-term horizon mark-ups could be increased above the actual need to cover future growing costs.

Recent actions by the Ukrainian government show that it is seriously considering the latter scenario, as it tried recently to limit the mark-ups (or margins) for certain product groups[3]. In light of the previously discussed mechanism, where expectations of future inflation impacts inflation today, breaking (or weakening) this link by administrative measures seems doubtful. A more coherent policy strategy would need to be directed at influencing expectations, rather than limiting their impact on actual inflation. Besides, such administrative measures seem of limited effectiveness and might lead to shortages rather than preventing prices from rising. In this sense, the problem will only be transferred into the future rather than solved. Only true competition among producers or retailers can be the mechanism that determines the "economically" justified level of mark-ups, a proven mechanism that works relatively well in other countries. Therefore, only measures aimed at stimulating competition (e.g., easier entry and exit of firms, higher international competition, and increased efficiency of the work of the Anti-Monopoly Committee alongside best international practices) could help to solve this problem in longer-term horizon.

To sum up, economic research shows clearly the importance of expectations for the inflation process. For the NBU, a deeper knowledge of private sector expectations is therefore warranted as it is a key variable for its monetary policy conduct. While this is an important issue already today, a declared future transition to an inflation targeting (IT) framework would even increase its importance. The inflation forecast, which is a key element in any IT-framework, would benefit from a cross-check with private expectations. Furthermore, once data on expectations are available, their properties can be analysed, which is equally important. This includes analysing the nature of the expectations formation mechanism (i.e. whether expectations are rational). Testing for existing biases, analysing dynamic adjustment properties and efficiency issues are part of such analysis of rationality.

3. Approaches to measure inflation expectations

The last chapter showed the importance of expectations for current inflation dynamics. However, expectations of inflation by private agents are not directly observable, i.e. they need to be quantified empirically. Two broad methodologies to measure such expectations exist in practice[4]. The first method is survey-based and tries to assess inflation expectations directly by asking private agents regarding their expectations. The second method relies on inflation-linked (or –indexed) government bonds to calculate such expectations indirectly from observable market prices. The following sections will explain these methodologies in more detail, including country references. The main focus is here on consumer price inflation (CPI) expectations.

3.1 Survey-based measures

Expectations of future inflation can be directly obtained from surveying economic agents. Such agents can be households, enterprises, or professional experts. Many consumer or business surveys now include questions regarding expected price developments over the near- to medium term, and financial information providers conduct regular surveys among experts. The

[2] See for the theoretical argument the discussion in Gali/Gertler (2000): Inflation Dynamics: A Structural Econometric Analysis, NBER Working Paper No. W7551

[3] These administrative measures tried to cap mark-ups on prices of key food products like flour, bread, meat and vegetables at 15 percent. They were, however, vetoed by the President on 3 June 2008.

[4] A third method uses economic theory and econometric methods to estimate such expectations. For further reference, see Elkayam/Ilek (2007): The Information Content of Inflationary Expectations Derived from Bond Prices in Israel, Discussion Papers, Bank of Israel.

following section gives a short overview of the main surveys conducted in major developed countries[5]:

EU:

1. The *European Comission* conducts since 1985 a monthly harmonised consumer survey (EC survey) where 20,000 households are asked about the inflation expectations 12 months ahead. The answers are not numerical values, but provide only qualitative information on the future direction of change. However, certain quantification algorithms can be used to derive quantitative expectations from the survey data. With the extension of the EU in 2004, this survey also covers Central and Eastern European States such as Poland, Czech Republic, Hungary and Slovakia (CEE4). However, with the exception of Hungary (1993), the data for the CEE4 start only in 2000-2001.
2. Since 1999, the *European Central Bank (ECB)* asks quarterly in its "Survey of Professional Forecasters" around 70 specialists for short- to medium term euro area inflation forecasts (1, 2 and 5 years ahead). Further information regarding the probability distributions of single forecasts is also collected, as well as other key economic variables (real GDP growth, unemployment).
3. *Consensus Economics* is the leading private international economic survey firm, which surveys experts in private and public institutions. Since 1989, expectations about major macroeconomic variables (including inflation) in major industrial countries are being surveyed, while over the recent past also emerging markets are participating in the survey. For euro area inflation, around 30 participants are asked monthly for their respective current and next calendar year forecasts. Twice a year, also longer-term forecasts (6 – 10 years) are being collected.

USA

1. The *University of Michigan* in its monthly "Survey of Consumer Sentiment" surveys households (consumers) about their quantitative inflation expectations over the next 12 months, and long-term (5-10 years) expectations are also collected. While qualitative questions are as old as 1946 (on a quarterly basis), the current quantitative monthly questions started in 1978. The sample size is 500-700 households. It is important to note that the survey is not based on the clearly defined consumer price index, but rather asks the participants about their general views on future prices changes.
2. The *Survey of Professional Forecasters* currently conducted by the Federal Reserve Bank of Philadelphia polls professional business economists at a quarterly frequency since 1968. The sample size varied from 9-83 members, with currently around 50 participants. For inflation expectations (in total 18 macroeconomic variables are polled), CPI inflation (including core inflation), Personal Consumption Expenditures (PCE) deflator and GDP deflator are being collected. The former two indicators are forecast 5 quarters ahead, but there are also medium (3 year ahead) annual forecasts as well as long-term values (5 and 10 years). The GDP deflator is forecast 5 quarters ahead as well as medium (2 year) annual forecasts.
3. The *Livingston Survey* is currently also conducted by the Federal Reserve Bank of Philadelphia. Starting in 1946, it polls professional economists from different institutions (currently 48, but varying from 14-63) twice a year. The inflation rates include the CPI and the PPI expected in 6 and 12 months ahead, as well as 3 annual averages for the current, the next and the year after the next. Also a very long annual average CPI expectation (10 years) is being collected.

3.2 Market-based measures

Another way to obtain inflation expectations is to derive them from the market prices of inflation-linked financial securities (i.e. bonds) in comparison to otherwise equivalent

[5] For more information on these surveys see ECB (2006): Measures of inflation expectations in the euro area, Monthly Bulletin 07/2006 (for EU) and Mankiw/Reis/Wolfers (2003): Disagreement about Inflation Expectations, NBER Working Paper No. W9796 (for USA).

conventional nominal instruments of the same issuer[6]. Inflation-linked government bonds are debt securities that are issued by governments where the coupon payments and the principal are linked to inflation, as expressed by a specific price index (e.g. the consumer price index CPI). Such inflation-linked bonds protect investors against inflation risk by guaranteeing a fixed real yield. This is unlike conventional nominal bonds, where these cash flows stay fixed in nominal terms, but the real yield changes with inflation. While the idea of linking the cash flows of such securities to inflation is quite old, the actual development of this market is quite recent, starting in the UK in 1981. This debut was followed by Canada (1991), Sweden (1994), the US (1997), France (1998), Italy (2003), Japan (2004) and Germany (2006), among others. Issuance is now relatively wide-spread, covering all major developed markets, and as a result such bonds have established a distinct asset class.

With the increasing sophistication of financial markets in emerging market countries, the trend to inflation-linked bonds is also becoming more common. In Central Europe, for instance, Poland has issued local currency bonds that are linked to CPI-inflation[7]. While still relatively small compared to the total amount of outstanding debt or new debt issuance, the trend towards more issuance of inflation-linked securities is expected to continue. In total, the outstanding amount of inflation-linked government bonds in both developed and emerging markets amounted to USD 1.5 trn in February 2008, which is a 50% increase over the previous two years.

The method of deriving inflation expectations from such bonds is indirect, as opposed to the direct observations of survey-based measures (see the previous section). This approach is based on market prices that are the result of activities of agents interacting in financial markets. The resulting inflation expectations are the average expectations over the corresponding maturity of the bond, which is often relatively long (e.g. 10 years). Box 1 explains how inflation expectations can be derived from such bonds.

Box 1: Calculating inflation expectations from inflation-linked bonds

The first step in deriving inflation expectations from such instruments is to compare its real yield with the nominal yield of an otherwise identical bond from the same issuer which is not linked to inflation. The resulting difference in nominal and real yields is called *break-even-inflation* (BEI). This is a first and important approximation of inflation expectations by financial market participants, but it is important to stress that BEI is not exactly identical to average inflation expectations over the maturity of the bond.

To see this, the following equation (1) shows the different components of the BEI:

(1) BEI = inflation expectation + inflation risk premium + other

Besides the term involving inflation expectations, risk-averse investors holding nominal bonds will also demand a risk premium as compensation for inflation risk. This risk premium will increase with the maturity of the bond as well as with the volatility of inflation. Only in the case of risk neutral investors, this premium would disappear. The third term "other" accounts for all other influences. This includes different liquidity characteristics in both markets. Normally, the lower liquidity in inflation-linked securities implies that these instruments need to offer a ceteris paribus higher real yield (i.e. are trading at a lower price than otherwise). Furthermore, compounding effects (as actual inflation fluctuates around its expected value) and differences in convexity between nominal and inflation-linked bonds are captured by this last term.

Source: Merrill Lynch; Barclays Capital

To sum up the discussion in this chapter, it is clear that there are both advantages and disadvantages connected with extracting inflation expectations from surveys and market prices of inflation-linked bonds. The advantage of market-based measures of inflation expectations

[6] In recent years, other financial contracts like inflation swaps appeared in developed markets, which are also used to extract inflation expectations. These derivative products are traded over-the-counter (OTC) between relatively large private financial institutions.

[7] Other examples of emerging market countries issuing inflation-linked bonds over recent years include Argentina, Brazil, Chile, Columbia, Hungary, Mexico, Israel, South Africa, South Korea, and Turkey.

are that they are available at high frequency (markets operate daily) and provide long-term expectations over the maturity of the bond. Furthermore, these expectations are based on real decisions of many agents rather than only on survey respondents. While survey-based measures are available at a lower frequency, they provide a direct measure of expectations which is not affected by other unobservable components like risk premiums. However, the problem that they are not directly linked to economic behaviour and that there might be incentives not to reveal the truth in such surveys is not fully solved yet. Taking these limitations of both methods into account, there is a strong case for using both approaches which should therefore always be cross-checked against each other. Jointly, they provide an important extension in the information set of public authorities.

4. Current practice in Ukraine

Turning now to Ukraine, the present chapter explores the currently applied methods to extract inflation expectations in the country. Again, the distinction between survey-based methods and market-based methods is kept.

4.1 Survey-based measures

In Ukraine, surveys of economic agents (businessmen, professional experts or consumers) aimed at assessing inflationary expectations are conducted by independent policy think tanks, the NBU and State Statistics Committee of Ukraine as well as private firms. The NBU conducts the *Business Outlook Survey*. The *Quarterly Enterprise Survey* is part of the *Business Tendencies Study* from the Institute for Economic Research and Policy Consulting (IER). The International Centre for Policy Studies (ICPS) is responsible for the *Consumer Confidence Survey*. Informational agencies (e.g. Reuters, Bloomberg, Consensus Economics) conduct polls of professional economists and forecasters. From the abovementioned agencies the longest time series of regular data is collected by the IER (39 points, quarterly) and the ICPS (32 points, mixed bimonthly and quarterly). The NBU time series and Reuters time series are relatively short (respectively 7 points, quarterly and 8 points, monthly). As for the survey held by State Statistics Committee of Ukraine, it has been launched in 1998 on a quarterly basis and asks enterprises whether sale prices will increase, decrease or stay the same in the next quarter comparing to the current prices. This poll might have provided us with the longest time series for analysis, but results of this survey and its methodology are unavailable for the public. Therefore, this paper considers only four surveys, which are conducted by NBU, IER, ISPS-Gfk Ukraine and information agencies.

Survey results provide in general very valuable information for policy makers and researchers. This concerns their potential role as a leading indicator of future inflation, the analysis of expectations formation and their concrete role in the inflation process. However, since the corresponding samples in which quantitative values of inflation expectations are obtained (i.e. NBU and Reuters surveys) are rather short, an empirical analysis on them was not performed.

The other two surveys, which are conducted in a qualitative way (IER, ICPS), have longer time series available. In these cases, we performed a relatively straightforward statistical analysis on them to shed further light on the relationship between expected and actual (i.e. realized) inflation. For this, we used correlation analysis, a technique that is widely used in practice[8]. While this should be considered a first step in the analysis of inflation expectations, a more rigourous analysis (involving formal econometric methods) should follow. However, this assumes that appropriate quantification algorithms are applied to the qualitative data[9] before they can be used in such empirical research.

Quarterly Business Outlook Survey by NBU

In this survey, enterprises are asked about their inflation outlook (measured as growth in CPI) for the coming 12 months. The answers are divided into 6 categories: a decrease in prices (i.e.

[8] See for instance: The Joint Harmonised EU Programme of Business and Consumer Surveys, European Economy, No. 6, 1997 (Annex A.9, p 119-126).

[9] See for instance Tomasz Lyziak/Ewa Stanislawska: Consumer inflation expectations. Survey questions and quantification methods – the case of Poland. National Bank of Poland Working Paper No. 37, 2006.

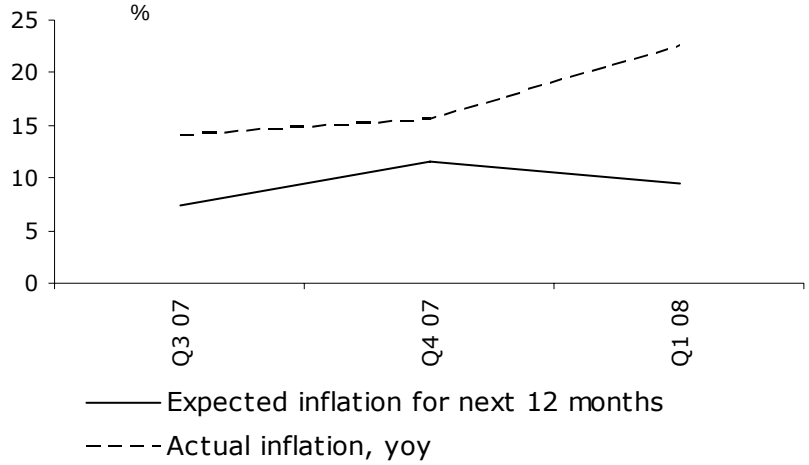
deflation), inflation growth below 5%, between 5% and 10%, between 10% and 15%, between 15% and 20%, and more than 20%. After that, fractions of respondents expecting inflation growth are weighted on the basis of above mentioned division into categories. The time perspective of this survey is shorter than in the surveys by the IER and ICPS discussed below.

As for enterprise characteristics, they differ in size, economic activity, share of state-owned or community property in the authorized capital, the activity of foreign contacts, financial and economic standing at the time of survey as well as other features. The distribution of enterprises according to these characteristics shows that most enterprises in the survey are small or medium-sized, are engaged in manufacturing industry, have a little share of state-owned or community property in the authorized capital, carry no export and import operations, and have a satisfactory financial and economic standing at the time of the survey. The sample consists of 1,236 enterprises. The distinctive feature of the survey is that it also asks about corresponding expectations of dynamics of input and output prices, as well as about the factors that had the biggest influence on them. The survey was conducted for the first time in the third quarter of 2006.

Inflation expectations according to this survey have recently risen substantially, indicating that economic agents are skeptical. Expectations have increased well above the respective NBU's inflation target, which constitutes 9.6% for 2008[10]. Right now, an increase in inflation expectations can be observed for the third consecutive quarter. The expected average level of inflation for the next 12 months amounted to 15.6% in the first quarter of 2008 against 13.6% in the fourth quarter of 2007 (see Figure 1).

Figure 1

Inflation expectations[11] and actual inflation (CPI)



Source: NBU, State Statistics Committee of Ukraine, own calculations

Representatives from all types of activities increased their inflationary expectations, while respondents from the processing industry, construction, wholesale and retail trade worsened their expectations most. As for regional patterns, respondents from Volhynian, Donetsk and Odessa regions were the most pessimistic.

Traditionally, according to respondents the most important factor influencing inflation is political instability (79% in the first quarter of 2008 versus 81.1% in the fourth quarter of 2007). This factor is followed by economic situation (73.7% versus 73.3%), production

[10] Monetary Policy Fundamentals for 2008 approved by National Bank of Ukraine Council decision №18 November 28, 2007.

[11] On the graph expected inflation is indicated in the period, which people were asked about, e.g. if people were surveyd in the first quarter 2007, the corrresponding value of expected inflation is indicated in the first quarter 2008 on the graph

expenses (34.8% versus 31.7%), household income (30.3% versus 26.7%), and tax pressure (19.8% versus 20.0%). Budget expenses (12.1% versus 11.2%) and NBU actions (1.3% versus 1.6%) are supposed to be the least influencing factors.

In addition to forecasting certain level of inflation over the next 12 months the NBU conducts a qualitative survey where respondents are asked:

i. how will the prices of products and services purchased by your enterprise change over the next 12 months as compared with the changes occurred during the previous 12 months?

ii. how will the prices of products and services sold by your enterprise change over the next 12 months as compared with the changes occurred during the previous 12 months?

Possible answers are "increase at a higher rate", "increase at the same rate", "increase slower" and "decrease". In the first quarter of 2008 the percentage of respondents expecting an increase in purchase prices constituted 99.5% and has almost not changed comparing to 99.6% in the previous quarter. Though, the percentage of respondents expecting an acceleration of inflation grew to 46.4% against 43.1% in the fourth quarter 2007. In the first quarter of 2008 the percentage of respondents expecting an increase in sale prices grew to 98.3% comparing to 97.8% in the previous quarter. The percentage of respondents expecting increase at a higher rate grew to 19.7% against 16.6% in the fourth quarter 2007.

The NBU survey is the only survey of economic agents in Ukraine that obtains direct quantitative assessments of inflationary expectations. Unfortunately, the shortness of the time series doesn't allow evaluating the predictive power of the inflation expectations collected by the central bank. To conduct research, several more years of observations are needed. Besides, further development of survey methodology could be advisable, including the extension of survey horizon and the introduction of monthly consumer panel surveys as it is conducted by the authorities in the EU.

IER survey of business tendencies and expectations

The Institute of Economic Research and Policy Consulting (IER) survey belongs to the group of **business tendency surveys**[12] (BTS) and follows the methodology developed at the IFO Institute in Munich, Germany, and then adopted by "Joint Harmonised EU Program of Business and Confidence Surveys"[13], which is a part of all European BTS's. In its Quarterly Enterprise Survey (QES) the IER asks about selling and purchasing price expectations for three months ahead. Based on respondents' answers on the above mentioned questions the index of sale price expectations (ISP) and index of purchase price expectations (IPP) are calculated. The index value, which reflects the difference between the share of respondents with negative and positive expectations, varies from -1 (decrease of indicator) to 1 (increase of indicator). Also, respondents are asked about main factors which influenced inflation over the next 12 months. The survey has been launched in 1996 and covers 300 manufacturing enterprises, randomly chosen in Southern, Western, Eastern and Central Ukraine. However, in this paper we used data starting from 1998[14].

According to recent survey results (May 2008) the majority of business continues to expect inflation. It is true for the both purchase price and domestic sale price. Both indices values are quite high and continue to rise compared to February: ISP has increased from 0.35 in February to 0.46 in May and IPP achieves a quite high level — 0.67 — during February and May. The highest ISP and IPP values are recorded for light industry enterprises (0.83 and 0.95 respectively).

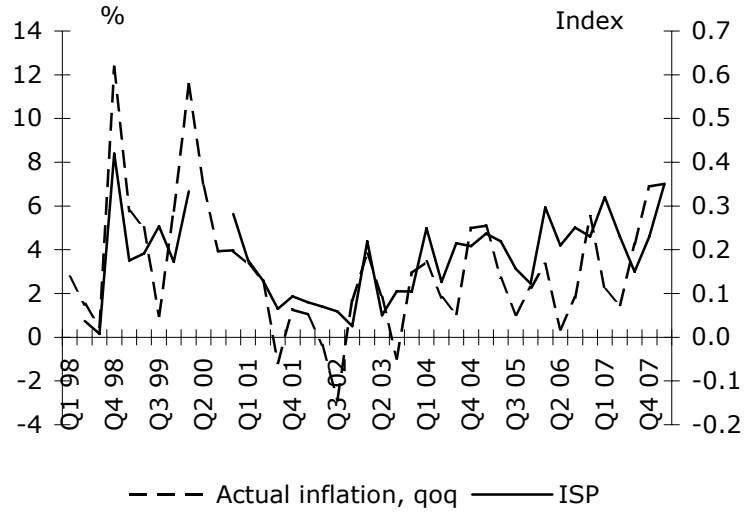
[12] Business Tendency Surveys: A Handbook, OECD, 2003.

[13] European Commission, "Joint Harmonised EU Program of Business and Consumer Surveys" in European Economy, No. 6, Directorate-General for Economic and Financial Affairs, Brussels, 1997.

[14] Data on inflationary expectations in 1996-1997 were collected at a different frequency and based on not directly comparable questions.

Figure 2

Expectations[15] of increase in domestic sales prices (ISP) and actual inflation (CPI)

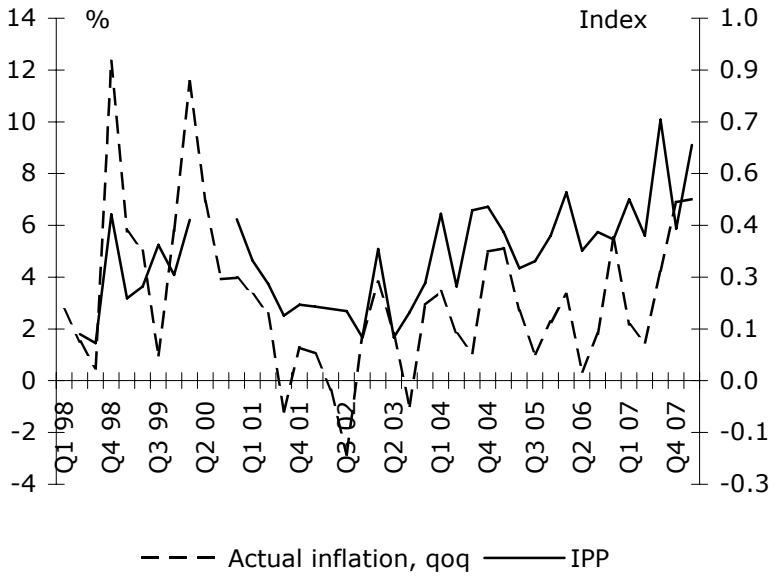


Source: own calculations, State Statistics Committee of Ukraine

Note: The gap in the second and third quarters of 2000 was due to the absence of surveys.

Figure 3

Expectations[16] of increase in domestic purchase prices (IPP) and actual inflation (CPI)



Source: own calculations, State Statistics Committee of Ukraine

[15] On the graph, expected inflation is indicated for the period for which people were asked about, e.g. if people were surveyed in the first quarter 2007, the corresponding value of expected inflation is indicated in the second quarter 2007 on the graph and compared to actual inflation over this quarter.

[16] On the graph, expected inflation is indicated for the period for which people were asked about, e.g. if people were surveyed in the first quarter 2007, the corresponding value of expected inflation is indicated in the second quarter 2007 on the graph and compared to actual inflation over this quarter.

Note: The gap in the second and third quarters of 2000 was due to the absence of surveys.

From the respondents' point of view inflationary expectations and world-wide inflation are the main factors which influence inflation in Ukraine during next 12 months (63.1% and 61.9% respectively). Tax burden and political situation within the country are also in the top of the list (48.8% and 43.8%). These factors are followed by products expenses (33.8%), harvest (22.5%), income of population (20.6%) and exchange rate (20.0%). The NBU activity is at the bottom of the list of factors which influence inflation in the country (2.5%).

The assessment of links between actual consumer inflation and the expectations of business regarding the development of prices showed that the expected changes in domestic sales and purchase price at the beginning of the quarter have quite high correlation with the CPI changes over the respective quarter (0.68 and 0.49 respectively). That means that IER estimates can be used as leading indicators of future inflation. On the other hand, the correlation of expected changes in domestic sales and purchase price with CPI changes over the previous quarter (i.e. historical inflation) is much lower: 0.44 and 0.26, correspondingly.

These results follow the intuition and the economic logic discussed in Part 2, as the evolution of domestic prices incorporate the changes in mark-ups set by enterprises. Although further research is definitely necessary, the expected changes in domestic prices could be used in a first step as inflationary expectation proxy in Ukraine. In a further step, it would be advisable to apply standard econometric techniques of transforming qualitative data into quantitative data[17] to get more precise numerical estimates of inflationary expectations, and use more formal regression methods for the analysis of these data and their relationship to actual inflation.

ICPS-GfK Ukraine "Joint Survey of Consumer Confidence"

The "Index of Inflationary Expectations" (IIE) is obtained within the framework of the "Joint Survey of Consumer Confidence" in Ukraine conducted by the ICPS and GfK Ukraine. The IIE along with the "Consumer Confidence Index" (CCI), the "Index of the Current Situation" (ICS), the "Index of Economic Expectations" (IEE), and the "Expected Changes in Unemployment" (ECU) is estimated through a random survey of Ukrainian households, which involves 1,000 individuals at the age between 15 and 59, who account for the most part of consumption in Ukraine. Members of the sample differ not only in age but also in gender and type of settlement (village, town, middle-sized city and metropolis). The margin of error is 3.2%[18].

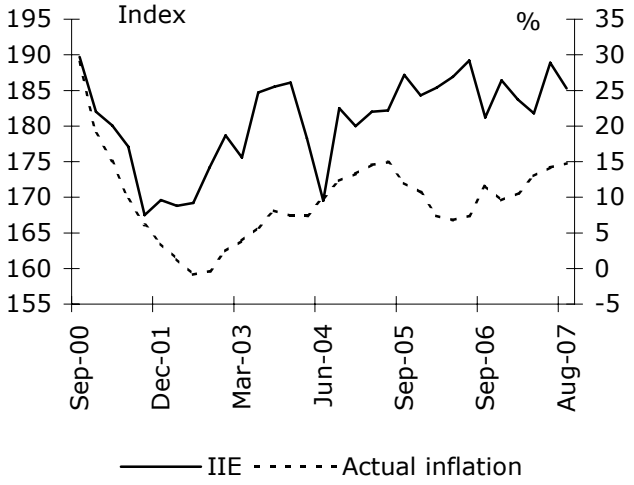
The methodology of the IIE estimation is quite simple and based upon only one question: how do you think prices for major consumer goods and services will change in the next 1–2 months? The difference between the share of answers that indicate the increase of inflation and the share of answers that indicate a decrease of inflation is the index of inflationary expectations (then 100 is added to eliminate negative values). Thus, the value of IIE falls within the range from 0 to 200, where 0 indicates that all residents expect a decrease in inflation, while 200 implies that all residents expect an increase in inflation.

[17] See for instance: Ryszard Kokoszczynski, Tomasz Lyziak, Ewa Stanislawska. Consumer inflation expectations. Usefuleness of survey-based measures – a cross-country study. Conference on Price Measurement for Monetary Policy May 24–25, 2007. Federal Reserve Bank of Dallas.

[18] www.icps.com.ua.

Figure 4

IIE[19] and actual inflation (CPI)



Source: ICPS

As it was discussed above, the ICPS series is the only series of inflationary expectations that is collected on the basis of consumers' survey. Therefore it is very valuable for the assessment of inflationary expectations development in Ukraine. The preliminary assessment shows that the correlation between IE and future actual inflation[20] stays at high 0.55, which is higher than correlation between IE and past actual yearly inflation, which equals 0.31[21]. Still, it is hardly possible to make conclusions about the exact nature of expectations based only on correlation analysis. Again, the quantification of qualitative data as it is done in the relevant literature and deeper study of the relations between various inflation sub-indices and expected inflation should help to reveal the entire predictive power of the index that the ICPS and GfK-Ukraine collect.

At the same time, it would be advisable to further improve the methodology of the survey, ensuring its stable periodicity and switching to the panel sample, which is one of key prerequisite for inflation expectation surveys.

Polls by market data providers (Reuters, Bloomberg, Consensus Economics)

Such polls are regularly conducted by asking professional economists in banks, research institutions about their inflation expectations. The results of these polls are then sent to subscribers of these market data providers. The Reuters survey is conducted at the end of each month (before the next data release) and respondents are asked to predict month-on-month and year-on-year inflation, as well as a full year forecast. For example, in June 2008 Reuters asked to forecast inflation in June 2008, and inflation by the end of the year. The following Figure 5 shows the Reuters forecast (median, minimum and maximum forecast) and actual inflation:

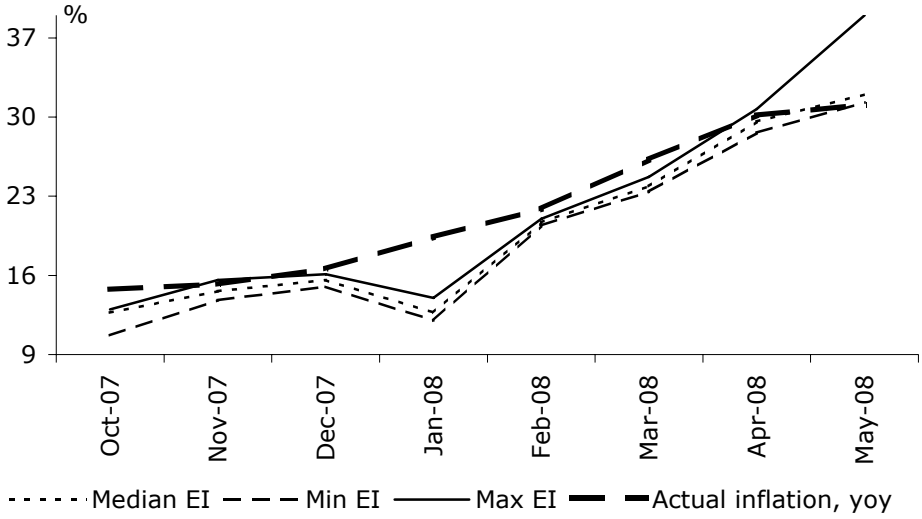
[19] On the graph, expected inflation is indicated for the period for which people were asked about, e.g. if people were surveyed in January 2007, the corresponding value of expected inflation is indicated for March 2007 on the graph and compared to actual inflation over this period.

[20] As an actual inflation we took actual yearly inflation in the second month after which survey was held. For example, the index obtained in January 2007 is correlated with actual inflation over March 2007-March 2006.

[21] As an actual inflation we took actual yearly inflation in the month, in which survey was held. For example, the index obtained in January 2007 is correlated with actual inflation over January 2007-January 2006. Besides, we tried to correlate IE with actual inflation for two months ahead, but it turned out to be lower. This means that consumers are better in predicting year inflation than 2-month inflation that is logical taking into account volatility in very short-run inflation.

Figure 5

Inflation expectations[22] (EI) and actual inflation



Source: State Statistics Committee of Ukraine, Reuters

The Bloomberg[23] poll produces "Ukraine Economic Forecasts" once a month. The underlying methodology is pretty similar to the Reuters one. This survey also incorporates forecasts on monthly and yearly inflation expectations with a breakdown in median, average, low and high values. Since participants of the surveys are almost the same and methodology is identical, there is no need to consider methodologies of Reuters and Bloomberg separately.

Consensus Economics is currently producing a monthly survey of more than 25 Eastern European countries ("Eastern Europe Consensus Forecasts"), where more than 150 professional economists are asked to forecast major economic variables. For Ukraine, currently around 11 institutions produce forecasts for annual CPI inflation in the current calendar year and the next, as well as correspondent quarterly forecasts. Both individual forecasts as well as averages are presented in the company publications.

The survey of forecasters is an important tool for assessing inflationary expectations in the country, as showed by international experiences discussed in Part 3. Though, the available poll results are unfortunately too short to evaluate the predictive power of the polls. Further research would be necessary as more points of observations are collected.

4.2 Market-based measures

Currently, there are no inflation-linked bonds issued by the Ukrainian government (or any other entity) outstanding. Therefore, market-based inflation expectations cannot be extracted due to the lack of available instruments.

In 2000, there were certain inflation-linked (restructured) bonds issued by the Ukrainian government (so-called POVDs). However, these instruments were not tradable but rather held at the NBU. Furthermore, only the coupon was linked to inflation, not the principal. Initially linked to official inflation projections, this was changed in 2005 when coupons where linked to actual past inflation. All this made the extraction of inflation expectations along the methods described in the last chapter impossible in the Ukrainian context.

[22] On the graph expected inflation is indicated in the period, which people were asked about, e.g. if people were surveyd in January 2007, the corrresponding value of expected inflation is indicated in February 2007 on the graph

[23] Results of the survey are based on estimations of analysts at Alfa Bank Ukraine, Concorde Capital, Dragon Capital Kiev, Dresdner Bank, Foyil Securities, ING, Merrill Lynch, Millennium Capital, Renaissance Capital, and Troika Dialog Ukraine.

5. Conclusion and policy recommendations

Expectations of future inflation influence the current behaviour of economic agents in many ways – wage settlements are an important example in this respect. Along these lines, economic theory establishes an important link between such expectations and current price formation. Therefore, anchoring inflation expectations at low levels is a prerequisite for fighting inflation successfully.

For the NBU, which carries as the central bank a major responsibility in fighting inflation, such expectations constitute thus a key information variable in its forward-looking monetary policy actions. While subsequent policy actions are not automatically linked to such information, they provide valuable input in the decision-making process. However, other branches of the public sector are also able to influence inflation dynamics. Therefore, in order to reduce inflation expectations and anchor them at permanently lower levels, a clear and coherent announcement and conduct of relevant policy measures (e.g. social policy, wage policy) seems necessary. Such announcements, if believed to be credible, would directly influence the behaviour of economic agents and help to support the NBU's fight against inflation. Otherwise, if such announcements are not made in line with the common goal of fighting inflation - or are not believed to be credible - a further spiralling of inflation expectations might result, which will lead to higher inflation. In this respect, also the impact of official government forecasts of inflation on inflation expectations needs to be mentioned. An unrealistic low estimate of inflation – which is neither backed by actual developments, nor by estimates by other institutions – lacks credibility and will not succeed in anchoring agent's expectations. Rather, the government will loose credibility and its potential impact on expectations formation will weaken.

Proposal 1: Reducing and anchoring inflation expectations at low levels should become a common task for all relevant branches of government, as this is a prerequisite for fighting high inflation. Policy measures that will be applied to fight inflation should be announced in advance to influence expectations.

Since expectations are not directly observable, they need to be measured. One way to do this is to extract them indirectly from market data of inflation-linked securities. However, such instruments are not available in Ukraine, which makes this approach currently 24 not operational. A second way to directly measure expectations is by survey methods. Here, a comparison between currently conducted surveys in Ukraine with international surveys points to some ways for improvement. While surveys regarding short-term expectations 1-2 months ahead (ICPS-GfK Ukraine) exist, the longest expectations horizon is 12 months ahead (NBU). In order to better monitor longer-term expectations, also questions regarding longer-term inflation expectations (e.g. 2 years ahead, or at least current and following calendar year) should be included in surveys. This practice is wide-spread in developed countries' surveys, and could be extended in the future further (e.g. 5 years ahead).

The reason to include questions about long-term expectations in the surveys is not related to their potential predictive power, which is naturally lower than short-term expectations. Rather, the advantage of having several expectation variables measured at different horizons is due to their different information content. While short-term expectations are an indicator signalling immediate price pressure (and provide often a good leading indicator function), long-term expectations are more informative regarding the perceived credibility of the respective authorities, mainly of the central bank. A lack of credibility of the NBU (i.e. a low degree of confidence by the public in its actions), which is mirrored in such high long-term expectations, would indicate a serious lack in the effectiveness of monetary policy measures. This alarming signal would point to a strengthening of the policy framework under which monetary policy is conducted. Especially under Inflation Targeting (IT), which is the declared medium-term monetary framework of the NBU, the proper management of inflation expectations is a key issue.

[24] This paper does not to attempt to discuss the issuance of such inflation-linked securities from an economic point of view. Being able to measure included inflation expectations is one factor in such a cost-benefit analysis, but by far not the only one.

Likewise, the household sector should be involved more actively as respondent in such surveys. Currently, only the ICPS Survey uses household responses, while all other surveys (NBU, IER) use data by enterprises. Relying on enterprise data seems currently indeed appropriate, as the price formation process in Ukraine relies to an important extent on firm's decisions in the context of mark-up pricing. However, such household data would likely deliver further insights and complement the existing data. It is interesting to note that enterprises do not play an important role as respondents in such surveys in developed markets.

Proposal 2: More efforts should be undertaken to strengthen the measurement methodologies of surveys conducted in Ukraine. First, the sectoral coverage should be broadened and include a more wide-spread representation of households. In such a way, an important indicator for detecting near-term price pressures can be obtained. Second, the horizon for which expectations are asked should be extended, since long-term expectations entail valuable additional information. While the indicator function of such long-term expectations is a secondary issue, they mirror the perceived credibility of the central bank and are therefore very useful.

The currently existing survey data are available to public to varying degrees. While a number of surveys are freely accessible and receive wide attention in the media, other surveys are sent only to subscribers (as in the case of financial data providers such as Reuters, Bloomberg, etc.). At the same time, this prevents a comparative study of different indicators, analysing its information content and pointing to differences and similarities. Central banks in developed markets like the ECB monitor and publish such comparative overview of inflation expectations in their communication with the public. In Ukraine, the NBU could take the lead in providing and analysing different surveys in a comparative manner. In the absence of real-time data obtained from inflation-linked bonds, such a regular monitoring of all available indicators would enlarge the information set of the public.

Proposal 3: A regular monitoring and comparative analysis of all available survey data seams appropriate. Following the example of other central banks like the ECB, the NBU could take the lead in this field.

Once more detailed and longer time-series of data are available, more research efforts should be devoted to their detailed analysis in a comparative framework. In the present paper, we performed a preliminary analysis using relatively simple statistical concepts (correlation analysis). For the cases where sufficient data were available (IER and ICPS-GfK surveys), the results showed some success in predicting future actual inflation on the basis of such expectation data (especially in the case of the IER survey). However, these preliminary results should be substantiated by applying more formal techniques, which are based on quantification of qualitative survey results. A prime concern is the quality of the surveys in terms of predicting actual inflation, i.e. whether people exhibit rational expectations. This concerns in a first step whether forecasts are unbiased, i.e. they show on average no systematic deviation from actual inflation. Further steps would try to answer if forecasts are efficient in the sense that they use all available data. Econometric work would involve here the analysis of forecast errors, their respective autocorrelation and whether the inclusion of other variables would improve the performance of the forecast. In case the rationality of forecasts must be rejected, other hypotheses like backward-looking expectations formation or mixed (hybrid) models can be tested. In this process, more information about the nature of the expectation formation mechanism can be extracted, especially when separated in short-term and long-term forecasts.

While the influence of expectations on actual inflation in theory is broadly uncontested, the exact nature is subject to much disagreement. Here again, survey data could shed more light on this issue by helping to quantify the theoretical relationships through econometric work. This would deliver new insights about the role of expectations play in inflation dynamics.

Proposal 4: A relatively straightforward correlation analysis that we performed revealed the predictive power of different expectation surveys, notably the one by conducted by the IER. However, once more detailed and longer data series on expectations are obtained, increased effort should be devoted to their formal analysis. This analysis includes the quality of expectations in terms of predicting actual inflation (unbiasedness and efficiency), alternative hypotheses of expectation formation, and a quantification of their exact role in inflation dynamics.

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