



**9<sup>TH</sup> INTERNATIONAL ASECU CONFERENCE ON  
“SYSTEMIC ECONOMIC CRISIS: CURRENT ISSUES AND PERSPECTIVES”**

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**INFLATION EXPECTATIONS IN MACEDONIA AND CRISIS-TIME  
DYNAMICS**

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**Abstract**

*Measuring the market beat via inflationary expectations has become a standard analytical procedure of central banks. The results, usually an aggregate of financial experts' opinions, households' expectations and the CPI provide an invaluable insight into the animal spirits currently prevailing in the economy. Inflation expectations reflect the financial experts' valuations of the rate of growth of the monetary base and help anticipate future trends in prices relative to domestic economic activity. Their importance cannot be underestimated as they can directly influence the price level while sending and gathering various information signals.*

*The continuous monitoring of information expectations poses a great challenge for modern central banking. At the heart of the problem lies the fact that expectations are a psychological phenomenon, which by its very nature, is difficult to observe. This is the problem facing the National Bank of the Republic of Macedonia, which has, as late as 2006, started its own operation of collecting survey data regarding inflation expectations from several different sources providing differing views on the future economic developments domestically.*

*This paper will provide a short, case-in-point overview of NBRM's survey design, its main advantages and shortcomings, as well as an initial examination of responses on a quarterly basis during the five years for which the data is available. The target audience, the methodology decided upon in conducting the survey and the channel for signal extraction are to be discussed in detail. While results may be inconclusive due to the short time series, they nonetheless provide an invaluable insight into the changing perceptions with the onset of the Global Financial Crisis and reveal the backward looking nature of inflation expectations in the Republic of Macedonia as well as the existence of the animal spirits premium .*

**Keywords:** *inflation expectations, survey methodology, information signals, financial crises*

JEL Classification: D84, E31, G01



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### 1. Introduction

The central role of expectations formation has been critical to understanding the nature and dynamic functioning of the economy. The ability of economic agents to be forward-looking and to correctly anticipate any changes in the monetary aggregates is inextricably linked to rational expectations, a pivotal conjecture in modern macroeconomic theory. During periods of financial slowdown, when there appears a sudden increase in risk perception over the leading sectors in the domestic economy, expectations for the future state of the price level assume the role of the main driver in the economy, which will either add gas to an already accelerating vehicle that may spiral out of control, or which will slow down and go back to its initial trajectory. Therefore, inflation expectations occupy a crucial spot in monetary theory and policy, in particular because of their ability to influence the aggregate price level, but also because of their informative value and the ability to act as a feedback mechanism for signal extraction. Expectations represent the link between money, interest and prices, as they drive wage negotiations as well as saving and investment decisions. However, one must emphasize their main drawback; due to their deep psychological nature, it is impossible to directly observe expectations (Barnett et al., 2010). Moreover, predicting future inflation in transition economies through monetary aggregates and other variables has shown to be "extremely difficult," according to Petrevski (2007, p. 83), with the Republic of Macedonia being no exception.

Developing a direct measure of expectations has become an elusive goal to a host of economists, unable to settle on one preferred method for dealing with this issue. This paper contributes to the growing literature on survey-based measures of inflation expectations by examining a very specific case of the inflation expectations survey based on the Macedonian denar and hence reveals several interesting results. First, the survey participants are backward-looking in their expectations. Second, the private sector respondents incorporate a so-called *animal spirits premium* in their expectations, causing them to consistently overshoot in times of economic booms and undershoot during crises. Third, financial institutions are indeed conservative and are much less volatile in their expectations formation than the other respondents.

The remainder of this paper is structured as follows: Section 2 discusses the relevant methodology. Section 3 offers an overview of current macroeconomic literature. In Section 4 denar area inflation expectations are estimated. Section 5 presents the results and their interpretation. Section 6 concludes.

### 2. Methodology

The analysis presented in this paper relies heavily on the results received from a one-page questionnaire distributed from the National Bank of the Republic of Macedonia to a select group of national opinion-makers. The time series under analysis cover a period since the survey's inception in 2006 until 2010 for which data is available in quarterly increments. The



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authors will examine forecasts given about the general state of inflation expectations, decomposed and quantified in order to extract valuable signals for the general state of the domestic economy at the time. As the period in question covers expectation formation at the time of the first signs of financial turmoil in Macedonia, it will provide a rare insight into the dynamics of the crisis and its effect on the survey respondents' reaction over time. Due to the small sample size and low frequency of the survey, any relationships derived from regression analysis and econometric treatment may provide spurious and inconclusive, so the authors had decided against inferential statistics until a larger sample is available.

### 3. Literature overview

Three major channels for signal extraction of the future state of the price level have been identified in the current macroeconomic literature: individual forecasts by financial experts, household and private sector inflation surveys and measures derived from financial market instruments. Although competing, each of these empirical methods provides a way of direct quantification of expectations and thus deserves its own merit.

The first channel focuses on a small number of economic agents who hold a large quantum of information related to finance and economics and are thus ideally positioned to assume the role of professional forecasters (Posen, 2011; Carroll, 2003). These individuals are in possession of large amounts of asymmetric information, which in some cases may even be regarded as *insider knowledge*. Based on their individual inference, these experts often run the risk of being either subjective or motivated to disclose inaccurate forecasts, should the incentive for personal profits overshadow the benefit of media exposure. Empirical evidence confirms the skeptics, as El-Shagi points out that “expectations prevailing in the market results outperform forecasts”, even though it is “slightly, not significantly” (2009, p.24).

The second channel extracts information from inflation-indexed financial market instruments featuring a high-frequency aggregated data that offers the opportunity for sophisticated financial analysis and interpretation of a host of complex signals (Swanson, 2006; Gürkaynak et al., 2005). The major prerequisite for this method is a well-developed, high-turnover trading platform covering a deep pool of economic agents. Following this definition would automatically eliminate small and underdeveloped economies emerging from past economic systems with tight reins on information processing. Moreover, extracting the expectation component even in deep markets may require some additional assumptions (Berk, 1999) and thus involve additional complications such as herding, time-varying risk premia and regulatory requirements (Millet, 2006).

The third channel captures inflationary perceptions present among households and private-sector firms by directly surveying the pulse of various groups of economic agents. If done correctly, this channel can aggregate inflation expectations from a representative sample, thus presenting itself as an empirically popular alternative (Forsells & Kenny, 2002; Galati et al., 2011). Although widespread, these surveys exhibit a number of disadvantages, including, but



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not limited to high costs, low frequency, small and heterogeneous number of respondents and an uncanny propensity for statistical bias to percolate in certain population samples as households, writes Smyth (1992), overestimate the current rate of inflation in general.

One of the main questions arising from the comparison of these three channels of expectation measurements concerns the accuracy of their forecasts. When comparing the available measures for determining inflation expectations the averaged values extracted from these channels often hide significant cross-sectional dispersion of expectations (Mankiw et al., 2003). Namely, depending on which agents' expectations are taken into account during the time horizon, it is possible for differences in predictions to arise. Individual economic agents will undoubtedly have differing views and expectations than the central bank, as will professional forecasters when compared to the private sector. In this regard, Curtin (2005) confirms that consumer inflation expectations are heterogeneous. The reason behind this fact lies in *rational inattention*, a microfounded concept that describes the economic agents' inability to process all of the available information due to their limited capacity in terms of time and material resources, which gives rise to differing predictions that can persist over relatively long time intervals (Sims, 2003). These disagreements about inflation expectations derived from different channels should, in principle, be reduced as time passes, i.e., there should be a convergence in expectations (Gnan et al., 2009), even though this process may take a while. Nevertheless, there exists empirical evidence that clearly defined and publicly disclosed strategy of monetary policy can reduce heterogeneity between inflation expectations and can simultaneously accelerate the convergence towards a uniform view of the private sector vis-à-vis the central bank (Orphanides & Williams, 2010). In order for this to happen, however, inflation expectations must be institutionally anchored and communicated in the direction from the monetary authority to the private sector, an act aimed at reducing uncertainty in the financial system and promoting long-term commitment to price stability (Mishkin, 2007).

#### 4. Estimating denar area inflation expectations from survey data

The continuous monitoring of inflation expectations in the domestic economy poses one of the greatest challenges for modern central banking. Knowing all the possible time-paths for the movement of inflation expectations within a specific time period is necessary for the proper formulation of the central bank's reaction function, so as to be able to establish long-term targets for inflation anchoring. Even though among the last ones to do so in Europe, the National Bank of the Republic of Macedonia (NBRM) nevertheless instituted a survey to measure inflation expectations at the beginning of 2006. Each quarter, the survey is conducted at a national level where a questionnaire is sent out to three different types of respondents – economic analysts, private sector firms, and financial institutions. In a stylized manner, this captures the three types of signal extraction channels available: professional forecasters, private sector participants and financial market instrument creators, respectively, while keeping in mind the limited depth and development of the Macedonian financial market. The



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survey participants are asked two sets of questions, one referring to short-term, while the other referring to long-term expectations and an optional qualitative questions asking about the reasons for the respondents’ particular outlook. Due to methodological inconsistencies from one survey to the next, this paper will only examine long-term – defined as end-of-year - expectations that have already been quantified by the respondents.

Over time, the number of survey participants has been steadily growing, starting from 44 sent out questionnaires and 32 returned with responses in Q1 of 2006 up to 73 sent out questionnaires and 41 returned in Q3 of 2010. The most populous group is that of the private sector, consisting of 53 potential respondents, followed by the economic analysts’ group with 13, and financial institutions with 7 potential survey participants by the end of 2010. It is important to note that despite the significant difference in sample populations, the weight stipulated by NBRM’s methodology is equally shared among the three groups, with each of the groups weighing in the final inflation expectation estimate with 33.33%. Table 1 gives a descriptive statistics breakdown of the three separate groups of respondents.

**Table 1 Descriptive statistics for surveyed inflation expectations in the Republic of Macedonia, 2006-2010**

Respondent Groups	Mean	Std. Dev	Median	Min	Max
Economic Analysts	1.78	2.74	1.00	-5.00	8.00
Financial Institutions	1.33	2.11	1.00	-2.75	6.00
Private Sector	3.68	4.04	4.00	-5.00	9.00
Overall	2.26	3.19	2.00	-5.00	9.00

*Source: Authors' own calculations according to NBRM data*

As can be seen from the above table, the mean value for the inflation expected by economic analysts till year-end is 1.78%, by financial institutions is 1.33%, by private sector firms is 3.68% while overall it amounts to 2.26. The standard deviation for each sample group ranges from 2.11 for financial institutions, to 2.74 for economic analysts, to 4.04 for the private sector and 3.19 overall. The median value is 1.00% for both economic analysts and financial institutions, 4.00% for the private sector and 2.00% overall. The minimum value for expected inflation is -5.00%, while the maximum value for expected inflation is 9.00%. Even in a sample size containing as little as 19 observations, some interesting patterns emerge. First and foremost, there is a very large variation from minimum and maximum values in a five-year time span, but this can largely be attributed to the irrationally exuberant period immediately preceding the economic downturn. Second, banks are the most conservative and consistent forecasters, while private sector firms are the most optimistic ones. Third, private sector firms alter their opinions the most in order to adjust their investment decisions to the changing economic landscape.

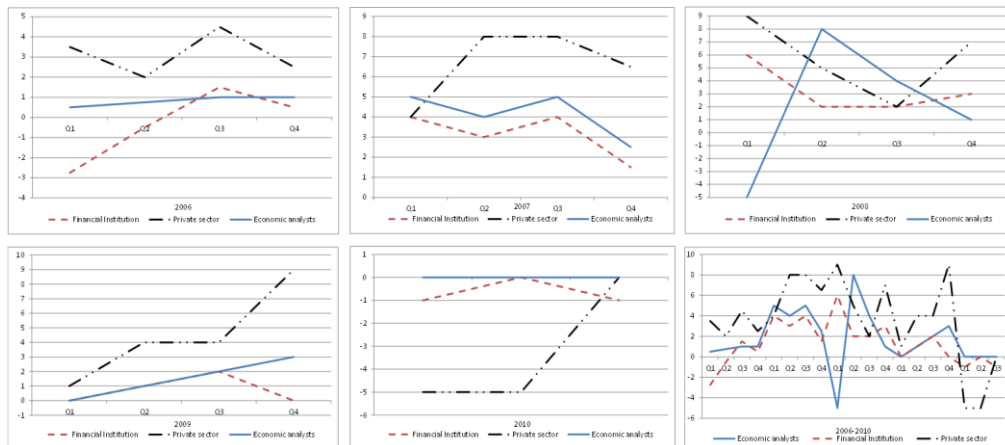


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### 5. Discussion of results

The participants' inflation expectations are first organized according to annual horizons, corresponding to years 2006, 2007, 2008, 2009 and 2010, as well as an overall, five-year horizon containing data for the 19 available quarters. Figure 1 shows six different graphs comparing inflation expectations by various groups and their behavior from one year to the next, allowing for investigation into whether expectations are heterogeneous across individual survey participants and groups. Panel 1 (2006) shows a strong correlation between the private sector and economic analysts expectations, which is especially evident in the three last quarters of the year. Panel 2 (2007) of the following year show a similarly strong alignment of expectations, but this time between the group of economic analysts and financial institutions. It is important to note that the private sector exhibits completely diverging expectations, reflecting its exuberant entrance into the boom years of the stock market. Panel 3 (2008) illustrates a sharp screeching to a halt by the financial institutions in the second part of the year. This can furthermore be interpreted as having the information signal from the banks' parent companies abroad finally seep through the domestic ranks. Panel 4 (2009) shows a gradual improvement of the expectations, even though the beginning of the year is marked with negative expectations. A similar situation is present in Panel 5 (2010) where there are diverging views of the state of the economy, despite the financial institutions' and the private sector's expectations sitting firmly in recessionary territory. Finally, Panel 6 (2006-2010) gives a five-year overview of the inflation expectations where the sharp dip in confidence about the future is most visible among economic analysts.

**Figure 1 Homogeneity of inflation expectations across groups during different time horizons, 2006-2010**



Source: Authors' own calculations according to NBRM data

As evident from the above panels, there exists strong homogeneity across different groups of survey respondents, with the most interesting finding being the *animal spirits premium*

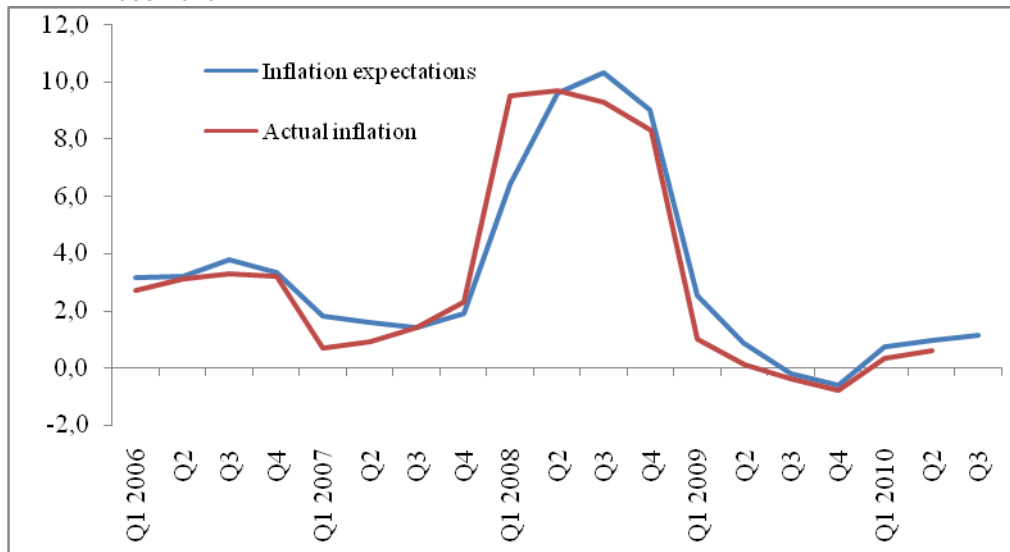


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consistently present among the private sector participants, which can swing both ways and adds a significant volatility to the surveyed expectations.

When aggregated in single time series and compared to the actual inflation at the same time period, another set of interesting findings emerge. While the two time series exhibit a very high degree of correlation, it is evident from the graph that the expectations are trailing the actual results, demonstrating an observable case of backward-looking expectations. Moreover, prior to the buildup of the domestic stock market euphoria, from Q1 2006 to Q4 2007, inflation expectations were fairly stable and moved within a respectable 4% band. When expectations began picking up on the accelerating state of the economy and partly reflecting the global boom abroad, the values of both of the expected and actual inflation soared to almost 10%, evident in the sharp spike during the Q1-Q3 2008 period. As soon as the global economy ground to a halt and those effects spilled over via various channels into the domestic economy, inflation expectations plummeted in Q1 2009 and kept falling until entering negative territory during Q3-Q4 2009. The most interesting result to deduce from this graph is the inability of either one of these three groups to correctly anticipate the impending stock market boom as well as the inevitable contraction followed by a further deepening of the crisis. Apart from a few individual cases of luminary thinking, exemplified by Filipovski (2008) and Fiti (2009), the majority of the survey respondents failed to predict the dynamics of the national economy in the five-year period under consideration.

**Figure 2 Comparison of surveyed inflation expectations and actually realized inflation, 2006-2010**



Source: Authors' own calculations according to NBRM data





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### 6. Conclusion

This study empirically analyzes and assesses the National Bank of the Republic of Macedonia's first attempt to directly measure inflation expectations domestically, during the 2006-2010 period. Even though the sample size of the available data is small and low in frequency, it nonetheless provides a number of useful insights into how expectations are formed, their nature and anticipatory power, as well as their dynamic behavior during crisis times.

First and foremost, the survey respondents generally considered to be the opinion makers in the Macedonian economy display backward looking expectations and generally exhibit ex post adjustment of their perceptions. This can most easily be noted when comparing the weighted inflation expectations against the actual inflation, where a visible lag in anticipation appears.

Second, private sector respondents show a very identifiable tendency to over- or under-shoot their expectations, depending on the overall investment climate, thus adding to the volatility of expectation measurement. This trait has been dubbed the *animal spirits premium* as it captures the essence of the Keynesian waves of irrational optimism and pessimism present among economic agents.

Third, financial institutions have kept to their conservative image by curbing any excessive behavior and displaying consistently risk-averse behavior, in line with what both empirical and theoretical literature suggests.

Finally, one should applaud NBRM's attempts to measure the pulse of the domestic economy, even though the detected weaknesses in sample size, inconsistent survey methodology and non-transparent data availability should be eliminated without delay.

### REFERENCES

- Barnett, A., Macallan, C. and Pezzini, S. (2010), *Public Attitudes to Inflation and Monetary Policy*, Bank of England Quarterly Bulletin, Vol. 50. No. 2, 115-123.
- Berk, J. M. (1999), *Measuring Inflation Expectations: A Survey Data Approach*, Applied Economics Vol. 31, 1467-1480.
- Carroll, C. (2003), *Macroeconomic Expectations of Households and Professional Forecasters*, Quarterly Journal of Economics, Vol. 118. No. 1, 269-298.





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“SYSTEMIC ECONOMIC CRISIS: CURRENT ISSUES AND PERSPECTIVES”**

El-Shagi, M. (2009), *Inflation Expectations: Does the Market Beat Professional Forecasts*. IWH Discussion Papers.

Filipovski, V. (2008), *Macroeconomics and Stock Market, Contributions Dedicated to Academician Ksente Bogoev*, Macedonian Academy of Sciences and Arts, Skopje, National Bank of the Republic of Macedonia (2009), Quarterly Report, 283-300

Fiti, T. (2009), **Fenomenologija na ekonomskite krizi**, Ekonomski fakultet Skopje, Skopje.

Forsells, M. and Kenny, G. (2002), *The rationality of consumers' inflation expectations: survey-based evidence for the Euro area*, Working Paper Series 163, European Central Bank.

Galati, G., Poelhekke, S. and Zhou, C. (2011), *Did the crisis affect inflation expectations?*, International Journal of Central Banking, Vol. 7 (March), 167-207.

Gnan, E., Scharler, J., and Silgoner, M. A. (2009), *Inflation Expectations – Role and Measurement for Monetary Policy*, Monetary Policy and the Economy No. 2, 41-67.

Gürkaynak, R., Sack, B. and Swanson, E. (2005), *The Sensitivity of Long-Term Interest Rates to Economic News: Evidence and Implications for Macroeconomic Models*, American Economic Review, Vol. 95. No.1, 425–436.

Mankiw, N. G., Reis, R., and Wolfers, J. (2003), *Disagreement about Inflation Expectations*, NBER Working Paper No. 9796.

Millet, F. C. (2006) *Finding the optimal method of quantifying inflation expectations on the basis of qualitative survey data*, Paper presented at NBP Conference: The role of inflation expectations in modeling and monetary policy making.

Mishkin, F. S. (2007), *Inflation Dynamics*, NBER Working Paper No. 13147.

Orphanides, A. and Williams, J. C. (2010), *Monetary Policy Mistakes and the Evolution of Inflation Expectations*, Federal Reserve Bank of San Francisco Working Paper No. 2010-12.

Petrevski, G., (2007), *Equilibrium real exchange rate in Macedonia*, International Journal of Monetary Economics and Finance, Vol.1, No.1, 5-17.

Posen, A., (2011), *The soft tyranny of inflation expectations*, Speech given at Oxonia Distinguished Lecture, Oxford, Bank of England  
(<http://www.bankofengland.co.uk/publications/Documents/speeches/2011/speech474.pdf>)

Sims, C. A. (2003), *Implications of Rational Inattention*, Journal of Monetary Economics, Vol. 50. No. 3, 665–690



**9<sup>TH</sup> INTERNATIONAL ASECU CONFERENCE ON  
"SYSTEMIC ECONOMIC CRISIS: CURRENT ISSUES AND PERSPECTIVES"**

Smyth, D. J. (1992), *Inflation and the Growth Rate in the United States' National Output*, Applied Economics, Vol.24. No. 6, 567-570.

Swanson, E. (2006), *Would an Inflation Target Help Anchor U.S. Inflation Expectations?*, FRBSF Economic Letter, Number 2006-20, August.