

# CONDUCTING INFLATION EXPECTATION SURVEYS IN SOUTH AFRICA

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## 1. INTRODUCTION

Although widely anticipated beforehand, the Minister of Finance only formally introduced a policy of inflation targeting in his budget speech on 23 February 2000. On the same occasion he also set the target for CPIX inflation (i.e. consumer price inflation excluding the mortgage rate for metropolitan and non-metropolitan areas) as between 3% and 6% during the year 2002.

Nearly all central banks that have adopted inflation targeting monetary policy frameworks consult inflation expectation surveys. Even central banks that have not formally adopted inflation targeting, such as the US Federal Reserve, take the results of inflation expectation surveys into account in their monetary policy decisions. Central banks mainly use the inflation expectation survey results to (1) forecast inflation and (2) evaluate the credibility of their inflation fighting-policies.

In 1999, the South African Reserve Bank (SARB) commissioned the BER to conduct inflation expectation surveys in South Africa<sup>1</sup>. Trial runs were conducted during the first half of 2000 and the first set of final results calculated during the third quarter of 2000.

The purpose of this paper is to describe the method applied to measure inflation expectations in South Africa and to present the results. This paper begins with a few general remarks on measuring inflation expectations. The second section sets out the survey method and the results for the first year are discussed in the last section.

## 2. MEASURING INFLATION EXPECTATIONS: BACKGROUND

The literature on expectations as one of the causes of inflation and on the formation of expectations is extensive. We only provide the major conclusions reached in the literature.

Changes in demand (e.g. an exogenous rise in household consumption expenditure, which reduces the output gap) and supply conditions (such as a sharp increase in commodity prices) usually are the initial cyclical causes of a rise in inflation. This higher level of inflation, then, is often sustained by amongst other, inflation expectations, i.e.

expected future values of the inflation rate (Mohr, 1989: 57). Consumers, trade unions, producers etc. build these higher inflation expectations into wage demands, asset prices and selling price.

How are expectations formed? There are two lines of thought within the literature. According to proponents of the adaptive expectation hypothesis, expectations of future inflation are based solely on some distributed lag of past values of inflation. In contrast, adherents to the rational expectation hypothesis are of the view that people make use of all available information when forming expectations about future inflation. However, the combined insight derived from econometric studies and theoretical work tends to favour the view that neither the adaptive nor the rational hypothesis fully explains the formation of expectations. These hypotheses are two extremes and the truth lies somewhere in between (Wolter, 1993: 18; Roberts, 1998: 3).

Analysts disagree widely on the usefulness of expectations data. Researchers even reach opposite conclusions using the same data. See Gramlich (1983) and Roberts (1998) for example. Research on expectations therefore appears to be rather sensitive to the underlying assumptions of researchers. If the nature of expectation formation was solely adaptive, then it would have been a waste of time to conduct inflation expectation surveys, as their results would contain no additional information other than that already provided by past inflation. However, an analysis of the inflation expectations of different societal groups, such as business executives, analysts and households, provide valuable additional information. For instance, household inflation expectations have a strong bearing on movements in nominal wages, whereas those of analysts are closely correlated to changes in the interest rate (Englander & Stone, 1989: 27-32). Volatile and unpredictable movements in food and energy prices explain much of the bias and systematic errors of inflation expectations during the 1970s in the USA. In the USA, inflation expectation results are therefore a better predictor of core inflation than overall inflation (Englander & Stone, 1989: 27; Croushore, 1997: 8). The survey method also has a bearing on the usefulness of the results. The results of direct quantitative measurements of inflation expectations (i.e. respondents have to provide a number) are superior compared to those of qualitative surveys (i.e. respondents only have to indicate whether they expect “higher”, “the same” or “lower” inflation) (Batchelor, 1986: 101,117-118; Foster & Gregory, 1977: 320).

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### 3. MEASURING INFLATION EXPECTATIONS IN SOUTH AFRICA

A study of the international experience in conducting inflation expectation surveys revealed several options (Kershoff, Laubscher & Schoombee, 1999). The design of the surveys for South Africa was finalised at a meeting between the SARB and the BER in December 1999. The following option was favoured: dedicated quantitative surveys, to be conducted quarterly; with four societal groups to be quizzed, namely households, business executives, analysts and labour; and the questionnaire of the New Zealand survey to serve as guide for the design of the South African one.

The design of the survey of business executives, analysts and labour is treated separately from that of households, as the survey methods differ. The method is described in terms of the following headings: (a) Who are surveyed and how?; (b) What questions are asked?; (c) Are the results valid?; and (d) How are overall inflation expectations calculated?

#### *(a) Who are surveyed and how?*

In the case of business executives, analysts and labour, questionnaires are mailed to a panel of participants. Panels are ideally suited for longitudinal studies for a number of reasons (Mouton & Marais, 1988: 41). In South Africa, censuses of the business sector are not conducted regularly. With a panel, changes in the survey results can be attributed with more certainty to changes in expectations compared to when new samples are designed, especially if little is known about the composition of the universe and a sampling margin of error cannot be calculated. It is also rather time consuming, expensive and complicated to design a sample every time a survey needs to be run. Panel based surveys are also the internationally accepted norm for conducting inflation expectation surveys.

The so-called convenience non-probability sampling method was applied to construct the panel. In terms of this method, those who are available, meet the criteria for the survey and are willing to participate are selected (Fink & Kosecoff, 1998: 39-45, Van der Merwe, 1986: 73-74). Panels designed by means of convenience sampling can be biased. For example, those that are willing to participate may be more concerned or better informed about inflation than those that choose not to participate. These participants may also be more aware of changes in inflation than non-participants. Consequently the following steps were taken to improve the credibility of the results. Invitations to participate in the survey were mailed to business addresses obtained for

the most part from the Bureau for Market Research (BMR) at UNISA. Extra care was taken to ensure that the panel renders a fair representation of participants in the South African national economy (see Table 1). Measures to increase people's willingness to participate and thereby ensuring that such a wide cross-section as possible of the population is included in the panel, included the following: People are generally willing to participate in BER research projects, given its reputation as an independent university based research institute. The BER guarantees that individual replies are not revealed. Confidentiality not only increases participation, but also improves the reliability of the answers as it discourages "sticking to the consensus views" or providing deviate answers to attract publicity. A letter by the Governor of the SA Reserve Bank and a brochure explaining the purpose of the survey, which were sent with the invitation, also increased people's willingness to participate. People would rather participate in a survey where the national importance and use is clear and from which direct benefit can be derived (in the form of the summary of survey results) than one where the opposite applies. People are also less likely to participate in surveys that are complicated, that take a long time to complete and where they have to consult figures. Therefore the questionnaire has been designed in such a manner that it requires as little effort as possible for completion. There are only a few questions and the questionnaire can also be completed via the internet. To establish whether the views of the panel of respondents deviate from those not surveyed before, we will separate new recruits from current participants when we enrol new participants after three years or so. This will enable us to establish whether the responses of the new group differ from the existing one. If so, we will have to adjust the results.

After two rounds of recruitment in April and July 2000, 1 126 participants were recruited. The size and composition of participants are satisfactory. According to the SA Business Survey (Unilever Institute of Strategic Marketing, 2000: 139), the number of formal businesses with annual turnovers exceeding R35 million amounted to 48 000 in 1998. The size of the panel must be about 1 000 if the size of the universe is taken as 50 000<sup>2</sup>. The composition of the panel is set out in Table 1. Respondents of all the major economic sectors are presented in the panel. Regarding business people, manufacturers, retailers and service providers make up the largest share. In the financial sector, most of the participants are from financial brokerage firms. Details on the composition of the panel per position of the participant and size of the firm /

organisation presented appears in Kershoff (2000: 10-11). During the fourth quarter of 2000, the average response rate was 55%.

*Table 1 Composition of the panel of participants per economic sector*

|                                 | Number | %     |
|---------------------------------|--------|-------|
| Agriculture & forestry          | 66     | 6,2   |
| Mining                          | 11     | 1,0   |
| Construction                    | 22     | 2,1   |
| Manufacturing                   | 405    | 38,2  |
| Transport & public corporations | 18     | 1,7   |
| Wholesale trade                 | 76     | 7,2   |
| Retail trade                    | 241    | 22,7  |
| Motor trade                     | 12     | 1,1   |
| Services                        | 210    | 19,8  |
| Total business sector           | 1061   | 100,0 |
| Banks                           | 11     | 27,5  |
| Financial brokers & advisors    | 26     | 65,0  |
| Insurance companies             | 3      | 7,5   |
| Total financial sector          | 40     | 100,0 |
| Total labour sector             | 25     | 100,0 |

Regarding households, postal surveys cannot be effectively used in South Africa to quiz households due to the high illiteracy rate. The unequal distribution of telephones renders this alternative survey method also undesirable in South Africa. Personal at-home interviews appear to provide the best results. However, this technique also has its limitations, namely that it is rather expensive, a long time passes between the start of the field work and the release of the final results and it is sometimes difficult to get access to people's houses.

The services of AC Nielsen were contracted for the purpose of the conduction of the personal interviews. The inflation question forms part of their monthly omnibus survey. For every survey AC Nielsen compiles an area-stratified probability sample of 2 500 households. The sample is drawn disproportionately by race and within race, proportionately within community size within province. Weighting is applied across and within a number of demographic cells in order to correct the sampling proportions to gross up to the population as a whole. The weighting is based on estimates of the population derived from the All Media and Products Survey (AMPS). The samples cover blacks and whites in metropolitan areas, cities, towns and villages throughout South Africa. Coloured and Indian coverage include the major metropolitan areas. Half of the sample is made up of males and half of females. The total coverage represents 92% of the urban adult population and 53% of the total adult population. The address

and informant within each household is selected at random. Fixed rules apply for call-backs and substitution. A trained, experienced fieldworker uses a structured questionnaire and conducts the interview in the home language of the respondent. A minimum 20% validation check is carried out personally or telephonically on the work of each interviewer.

*(b) What questions are asked?*

The inflation expectation survey questionnaire conducted on behalf of the Reserve Bank of New Zealand and the main drivers of inflation in South Africa directed the choice of questions.

Business executives, analysts and labour are required to provide their forecasts for CPI and CPIX inflation for the current and following two calendar years. In addition, their forecasts for other variables, such as GDP growth, the rand/US dollar exchange rate, prime overdraft rate and wage increase, are also requested. Like the Livingstone Survey<sup>3</sup> conducted by the Federal Reserve Bank of Philadelphia in the USA, the most recent official figure on a particular variable is provided to respondents (Croushore, 1997: 2-3; Federal Reserve Bank of Philadelphia: 3). The benefit of providing historical information is that all respondents have the same information available when completing the questionnaire. To limit bias to the results, we not only include the information for the most recent year, but also the five-year average. Compared to the figure for the most recent year, the five-year average will change marginally from year to year. If only the most recent data point was provided, then large variations in this figure from one year to the next may influence the responses. The historic information provides respondents with a benchmark. Although nothing prevents respondents from taking a view that deviates totally from the historical experience, some may provide figures around this benchmark. A comparison of the results of the pilot study (when no historical information was provided) and the first final run (when historical information was provided) indicates a decline in the level of CPI inflation expectations, but that that of CPIX inflation remained the same (see Kershoff, 2000: 15-17).

One cannot directly ask households what they expect inflation to be, as few would know what is being asked. Based on the questions of the Survey Research Centre at the University of Michigan at Ann Arbor in the USA, the question put to households is as follows: "Over the past five years prices increased by on average 7% per year. Last year prices increased by 5%. By about how much do you expect prices in general to increase in 2001?" Households are asked about their price expectations and not about inflation

or CPIX given their limited knowledge of economic terms. Due to the high cost of personal interviews, the price expectations of households for only the current year are requested. As in the case of the other societal groups, the inclusion of historical information in the question lowered the average inflation expectation of households. The average declined from 10,5% to 7,4% (Kershoff, 2000: 26).

*(c) Are the results valid?*

The arithmetic mean (average) for each question and forecast period is calculated. Each response has the same weighting, as the research objective is to determine *average* expectations. Weighting would have been important if the goal was to establish an inflation *forecast*. The median, modus, minimum values, maximum values and standard deviations are calculated to assess how widely the values are dispersed from the average value. All “don’t know” answers are ignored. In the case of households, all answers exceeding 25% are also excluded<sup>4</sup>.

There is no objective benchmark for evaluating inflation expectations. The actual inflation rate is only to some extent a guideline for the level of inflation expectations, as inflation expectations and actual inflation can deviate a lot at times, especially when the central bank has not yet gained credibility shortly after the introduction of inflation targeting. In other countries inflation expectations only declined to the target of the central bank after the bank gained credibility after some time had passed.

During February/March 2000, the BER requested participants to its regular business surveys to provide their inflation forecasts. These results largely agree with those of the pilot study and first final run of the inflation expectation survey if cognisance is taken of the difference from when the surveys were conducted and the wording of the questions. One can say with more certainty that the results are a fair reflection of inflation expectations in South Africa since the results of two surveys based on different panels agree. In addition, an analysis of locational statistics and histograms revealed that the average is an appropriate descriptive statistic of the survey results of all societal groups (see Kershoff, 2000: 17-20, 27-28).

*(d) How are overall inflation expectations calculated?*

It is possible to calculate two measures of overall inflation expectations. Firstly, overall inflation expectations can be calculated as the unweighted average of the respective average expectations for CPI and CPIX inflation for the current and subsequent two years of business executives, analysts and labour. Secondly, overall inflation expectations can also be calculated as the unweighted average of the respective average

expectations for CPI inflation for the current year of households, business executives, analysts and labour. In this case, the price expectations of households are taken to agree with the CPI inflation forecasts of the other societal groups.

Of these four groups, labour has the smallest number of responses. In the case of labour an outlier can therefore have a big impact on this group's average and this in turn on the overall average. To handle such outliers, a set of maximum allowed standard deviations were laid down for labour, namely 1,5 for the current year and 1,9 and 2,3 for the subsequent two years respectively. When the standard deviation of a particular survey exceeds the upper limit, the maximum and minimum value are replaced with the median and the average recalculated. These upper limits are based on the results of the first survey and provide for the fact that the distribution of data becomes more widely dispersed the longer the forecast horizon.

#### 4. RESULTS OF INFLATION EXPECTATION SURVEYS – 2000/1

Between the third quarter of 2000 and the second quarter of 2001, overall CPIX inflation expectations exceed the upper limit of the Reserve Bank's target (see Table 2). However, this is not surprising. In other countries, inflation expectations also only declined to the central bank's target after a period of time. Analysts expect the bank to reach its target in 2002, but business executives and labour expect them to overshoot. An analysis of the results of business executives per economic sector reveals no apparent difference. The inflation expectations of service providers are, for example, not higher compared to those of manufacturers (Kershoff, 2001: 3). Intuitively the difference in expectations amongst societal groups could indicate that the nature of expectation formation of analysts are more rational compared to those of other societal groups.

Inflation expectations are declining over the forecast horizon. For instance, CPIX inflation expectations for 2002 are lower compared to that of 2001 (see table 2). However, a comparison over the same forecast period across different survey quarters reveals that the overall expectations of business executives, analysts and labour rose during the fourth quarter of 2000, declined during the first quarter of 2001, but picked up again during the second quarter. In contrast, household expectations declined continuously over the period in question.

Regarding households, the inflation expectations of blacks, lower income households and younger people are lower compared to those of people on the other end of the

spectrum (see table 3). No apparent pattern is discernible in respect of the level of education.

*Table 2 Inflation expectations – analysts, business executives and labour*

|               | Survey conducted during | CPIX inflation expectations in respect of the following years |      |      |      |
|---------------|-------------------------|---|------|------|------|
|               |                         | 2000  | 2001 | 2002 | 2003 |
| Analysts      | 00q3                    | 7.5   | 6.6  | 5.7  |      |
|               | 00q4                    | 7.9   | 6.7  | 5.8  |      |
|               | 01q1                    |   | 6.1  | 5.5  | 5.1  |
|               | 01q2                    |   | 6.6  | 5.7  | 5.4  |
| Business      | 00q3                    | 7.6   | 7.7  | 7.8  |      |
|               | 00q4                    | 7.7   | 7.8  | 7.8  |      |
|               | 01q1                    |   | 7.9  | 8.0  | 8.0  |
|               | 01q2                    |   | 7.9  | 7.9  | 7.9  |
| Labour        | 00q3                    | 7.1   | 7.0  | 6.7  |      |
|               | 00q4                    | 8.0   | 8.0  | 8.1  |      |
|               | 01q1                    |   | 7.9  | 7.7  | 7.7  |
|               | 01q2                    |   | 8.0  | 8.2  | 8.0  |
| Average above | 00q3                    | 7.4   | 7.1  | 6.7  |      |
|               | 00q4                    | 7.8   | 7.5  | 7.3  |      |
|               | 01q1                    |   | 7.3  | 7.1  | 7.0  |
|               | 01q2                    |   | 7.5  | 7.3  | 7.1  |

In the USA, households' average inflation forecasts proved to be superior to those of professional economists (Gramlich, 1983: 168). However, it is too early to say whether the same will apply in South Africa. Furthermore, supply side shocks may have biased inflation expectations in South Africa during 2000/1.

*Table 3 Inflation expectations – households*

| Survey conducted during    | 00q3 | 00q4 | 01q1 | 01q2 |
|----------------------------|------|------|------|------|
| Expectations in respect of | 2000 | 2000 | 2001 | 2001 |
| Total                      | 7.4  | 7.4  | 7.3  | 6.8  |
| Per population group       |      |      |      |      |
| Blacks                     | 6.4  | 6.5  | 6.7  | 6.1  |
| Coloureds                  | 7.4  | 9.0  | 8.6  | 7.9  |
| Indians                    | 9.2  | 9.1  | 9.0  | 8.2  |
| Whites                     | 9.2  | 8.5  | 8.0  | 8.1  |
| Per monthly HH* income     |      |      |      |      |
| R8000+                     | 9.5  | 8.1  | 8.0  | 8.5  |
| R4000-R7999                | 7.9  | 8.3  | 7.6  | 7.3  |
| R800-R3999                 | 6.9  | 7.0  | 7.2  | 6.4  |
| R1-R799                    | 6.3  | 6.6  | 6.7  | 6.0  |
| Per age group              |      |      |      |      |
| 16-24                      | 7.0  | 6.8  | 7.1  | 6.4  |
| 25-34                      | 7.2  | 7.0  | 7.1  | 6.6  |
| 35-49                      | 7.7  | 7.8  | 7.6  | 7.0  |
| 50+                        | 8.0  | 8.4  | 7.7  | 7.6  |
| Per education level        |      |      |      |      |
| Up to primary school       | 6.4  | 7.2  | 7.0  | 7.0  |
| Some high school           | 7.1  | 7.3  | 7.4  | 6.8  |
| High school completed      | 8.0  | 7.7  | 7.5  | 7.0  |
| Post matric / university   | 8.2  | 7.5  | 7.3  | 6.6  |

\* HH = household

## 5. IN CONCLUSION

The method the BER is applying to conduct inflation expectation surveys in South Africa was explained in detail in this article. This method agrees with the international best practice. Four quarters of survey results have been generated at the time of writing

of this article. It will be interesting to see if inflation expectations also decline to the Reserve Bank's target in the near-term future as has happened in other countries where inflation targeting monetary policy frameworks have been introduced.

#### NOTES

1. One option was to expand the existing, established surveys (such as the BER's business surveys and the US Graduate School/Beeld consensus forecast of professional economists) to include one or more questions on inflation expectations and start new surveys for sectors currently not covered, such as trade unions and the service sector. Another option was to develop a new, customised survey to exclusively gather information on inflation expectations.
2. The size of the sample must be  $\sqrt{2500} * 20 = 1000$  if the population is 50 000 (Van der Merwe, 1986:76).
3. In 1946 Livingstone, a columnist for the *Philadelphia Inquirer*, began asking business economists and later on also academic economists their forecasts for important economic variables. The Philadelphia Fed took over the survey when Livingstone died in 1990. The Livingstone survey is well known, as it was the only comprehensive set of inflation expectations data available in the 1970s to test new hypotheses on expectation formation.
4. In the pilot study, when no historic information on inflation was included in the question, the percentage of "don't know" responses and answers exceeding 25% were 17,5% and 19% respectively. These percentages changed to 17,8% and 2,6% respectively in the first final run when historic information was included.

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