

The first formal linking of the inflation perceptions and inflation expectations of South African consumers

Adel Bosch¹, Jannie Rossouw² and Vishnu Padayachee³

Abstract

This paper reports the finding of 2014-survey of inflation perceptions and inflation expectations in South Africa. This survey posed questions on (past) inflation perceptions and (future) inflation expectations to the same respondents, showing the degree in which inflation expectations are anchored in inflation perceptions. This research aligns South Africa with other countries and jurisdictions where such surveys are undertaken. This paper shows conclusively, for the first time in South Africa, that there is a feed through from inflation perception to inflation expectations. Therefore, inflation perceptions play a crucial role in the formulation of inflation expectations in South Africa. These results suggest that policy makers are not just charged with containing inflation expectations, but that they should also be vigilant that the confidence in official statistics, as well as the confidence in the SA Reserve Bank and government, impacts inflation perceptions which directly feed into inflation expectations.

1 Introduction

Central banks can have any one of a number of monetary policy objectives or mandates. These objectives can include any of (or any combinations of) price stability, price level stability, financial stability exchange rate stability, economic growth and/or employment. This paper deals with South African data, a country where the central bank has a clear mandate for price stability and financial stability. This paper focuses on the first of these two objectives, namely the achievement of price stability. In the case of South Africa this is

¹ SA Reserve Bank, PO Box 427, Pretoria, 0001. Corresponding author: adel.bosch@resbank.co.za

² Head: School of Economic and Business Science, University of the Witwatersrand, Private Bag 3, Wits, 2050.

³ Distinguished Professor and Derek Schrier and Cecily Cameron Chair in Development Economics, School of Economic and Business Science, University of the Witwatersrand, Private Bag 3, Wits, 2050.

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defined as keeping the inflation rate between 3 and 6 per cent per annum, the country's inflation target range.

This paper assesses the existence of linkages between inflation perceptions and the inflation expectations of consumers. It also aims to explore another dimension which recently made its way into this literature, namely the process of forming perceptions and expectations. Ranyard et al (2008) show how individuals' socio-economic environment impact on their formulation of perceptions and expectations. The use of the terminology "consumers" in the context of this paper can be the subject of some debate. The results of inflation survey among individual responses are often reported as *household* surveys. However, this is a misnomer, as the views of one member (not necessarily the head) of a household are recorded. These responses can therefore at best be reported as "individual responses" or the views of "consumers", the approach followed in this paper.

Bosch et al (2015) state that "(t)he expectations channel is one channel of the transmission mechanism, so anchoring inflation expectations is one of the ways (albeit an important one) that a central bank can use to maintain price stability". Berk (2000) explains that a central bank lacking credibility in its policy action in a quest to contain inflation within a target range could result in expected inflation exceeding the inflation target. Benford and Driver (2008) observe that inflation expectations are partly formed on the basis of the past values of actual inflation. This paper reports on the first testing of this observation for South African consumers. Similar research has been done by Kabundi et al (2014) where they decomposed inflation expectations for trade unionists, business people and analysts.

This paper is organised as follows: Section 2 summarises literature on inflation perception and inflation expectation surveys. Section 3 considers consumers' understanding of inflation. Section 4 deals with inflation perceptions and inflation expectations. Section 5 concludes.

2. Literature survey

2.1 On inflation perceptions and inflation expectation surveys

A review of available literature shows that central banks pay considerable attention to inflation expectations (see for instance Banco Central de Chile, 2008; Berk, 1999; Forsells and Kenny, 2002; Powers, 2005; SA Reserve Bank, 2008; Samuels 1967; or Sveriges

Riksbank, 2008). To the contrary, the inflation perceptions of consumers receive less attention. The reason is that containing inflation is by its very nature a forward-looking exercise, i.e. central banks take policy actions that will influence demand and inflation after a lag of some 12 to 24 months.

The literature shows considerable differences in the ways in which central banks assess expectations of future inflation. Rossouw et al (2009) have found that central banks use various combinations of the following to assess inflation expectations:

- Surveys of inflation expectations from groups of respondents (e.g., business people, consumers and/or trade unionists);
- Interest rate differentials between different asset classes (e.g., the yield on conventional bonds compared to the yield on inflation-linked bonds); and
- Inflation forecasts by financial market analysis.

Inflation expectation surveys are undertaken to assess the anchoring (or lack thereof) in the inflation target range of the country where the survey is undertaken. The theory underpinning this approach is that economic agents act according to their expectations. If inflation expectations are well above the inflation target range, the expectation is that expenditure will increase to avert future price increases, thus increasing near-term demand and therefore pressure on prices. For this reason inflation expectations receive considerable attention in the policy deliberations of central banks in inflation-targeting countries. Inflation expectations of business people, consumers⁴ and trade unionists are reported in the monetary policy reviews/inflation reports of central banks (see for instance Bank of International Settlements, 2008; Bank of Iceland, 2003; Blinder et al, 2008; Blinder and Wyplosz, 2005; Ehrmann and Fratzscher, 2005; Fracasso et al, 2003; or Leeper, 2003 on this matter). More recently, Kabundi et al (2014) decomposed the inflation expectations of the Bureau for Economic Research (BER) into the same three groups to identify which group were responsible for driving inflation expectations. The results showed that for South Africa, business and unions' perceived inflation targets lie outside the official target band.

⁴ In the case of South Africa the inflation expectations of consumers (called household inflation expectation surveys) are not reported in the *Monetary Policy Review* of the SA Reserve Bank.

Bi-ennial representative inflation perception surveys of consumers have been undertaken as a private initiative in South Africa since 2006. These surveys cover a representative sample of the South African population. Bi-ennial surveys, rather than annual or even quarterly surveys are undertaken as these representative surveys are expensive. These surveys cover the views of 3 500 male and female consumers from metropolitan, urban and rural areas and provide views of respondents aged 16 and older. The specifications of the survey composition provide additional confirmation that the results of these surveys cannot be viewed as “household survey data”. These surveys are used to assess the degree in which consumers have confidence that historic inflation figures are an accurate reflection of actual price increases (see for instance Bosch et al, 2015 for a review of such surveys).

In 2014 the South African inflation perception survey was expanded and posed for the first time to the same South African respondents, questions regarding their perception of past inflation, and what their expectation of future inflation is. The results are reported in this paper.

Similar surveys are undertaken on behalf of central banks in a number of other countries and jurisdictions, mainly with policy considerations in mind. For instance, Badarinsa and Buchmann (2009:5) state that “ ... survey data from the European Commission's Business and Consumer Survey ... (is used for) ... the purpose of quantifying disagreement in perceptions and expectations ... (of inflation) ... and constitutes one set of dependent variables being used for sub-sequent econometric analysis” in the euro area (see also Lindén 2005 on this matter). This data has been collected since 2003 (Biau et al, 2010:1).

Biau et al (2010:1) state that “(t)he results indicate that consumers hold very different opinions of inflation: perceptions and expectations of inflation range from high, or in some cases very high, to low and close to the official rate of inflation. For the euro area as a whole, consumers generally tend to overestimate actual inflation developments, particularly in terms of inflation perceptions ...”. The survey results from the euro area shows that “ ... respondents reveal very different perceptions and predictions of inflation depending on their income, age, education and gender” (Biau et al, 2010:1).

Likewise, inflation perception surveys among consumers are undertaken in New Zealand, Sweden and the United Kingdom, also with monetary policy objectives in mind (see for instance Brachinger, 2005; Jonung, 1981; Palmqvist and Stromberg, 2004; Pike, 2008 or Reserve Bank of New Zealand, [S.a.]). As in the case of the United Kingdom, survey results in Sweden show that “ ... with respect to the perceived rate ... (of inflation) ... , the major difference ... (of 1,7 percentage points) ... was found between men and women. ... The difference between men and women apparently indicates that perceived rates are influenced by individual expenditure patterns” (Jonung, 1981: 968; see also Brachinger, 2005). The Reserve Bank of India introduced a quarterly household inflation expectations survey in 2005 (see Reserve Bank of India).

The Bank of Japan also compiled a review of households' inflation expectations. Nishiguchi et al (2014) used this survey, which was first conducted in 1993, to analyse the degree of dispersion and disagreement of inflation expectations. The results showed that even if mean or median expectations remained the same, the shape of distribution of inflation expectations may have changed, which provides information about the variability and stability of inflation expectations.

Similar surveys were undertaken between August 1998 and April 2002 by the *Columbus Dispatch* in Ohio in the United States of America on behalf of the Federal Reserve Bank of Cleveland (Bryan and Ventaku, 2001b) among consumers. The survey results confirmed a link between consumers' perceptions of inflation and their demographic characteristics. Respondents with “ ... high incomes perceive and anticipate much less inflation than people with low incomes, married people less than singles, whites less than nonwhites, and middle-aged people less than young people ... (and) ... men and women hold very different views on the rate at which prices are changing” (Bryan and Ventaku, 2001b). This finding concurs with the findings of Biau et al (2010), Brachinger (2005) and Jonung (1981). Bryan and Venkatu (2001a) point out those consumers' inflation expectations might be indicative of how consumers perceive historic price movements.

This paper considers this comment of Bryan and Ventaku (2001a) in a South African context. The inflation perceptions (views on historic price movements) and inflation expectations of

the same group of respondents have been measured for the first time and the results and policy implications are reported in this paper.

2.2 On consumers' understanding of inflation

Ranyard et al (2008) follow Behrend (1977) to show that the understanding of inflation by the general public is limited, and that households are not fully aware of the personal significance of price changes, including the relationship between wages and prices.

Bastounis et al (2004) examine the role of psychological variables related to general attitudinal orientations and beliefs on the way 'lay people' think about economic phenomena, using a large cross sectional sample of peoples of heterogeneous cultures (Austria, France, Israel, Singapore, Turkey, among others). They couple this with the use of an instrument to measure beliefs about the cause of events in economic life. The results showed that participants' answers regarding the consequences of economic phenomena such as inflation, unemployment, interest rates and taxation policies were only thematically coherent. In general people who felt that they do not control their lives, distrust business and protest against the unfair treatment of workers, a broadly left wing⁵ view of the economy, " ... see the world as an unjust place, they rather support government intervention in welfare and are not satisfied by the economy on a personal or national level" Bastounis et al (2004:273). In relation to inflation perceptions, respondents in the sample distrusted supply forces (business) that they see as causing inflation. They would rather support government interventions to raise welfare. On the other hand, those people who believed that they had greater control of their destiny, generally expressed satisfaction with the economic system. They tended not to support government intervention such as price control, but support business initiatives and activities as a means to fight inflation. In other words, a more conservative right wing

⁵ Left wing and right wing terminology is used here in the same context as by Bastounis et al (2004).

political orientation. In general lay knowledge appeared to consist of fragmentary pieces of information and recollections (remembering) rather than precision about data or theories.

Leiser and Drori (2005) analyse and compare the “social representations of inflation” (2005: 3) in four groups of people in Israel who did not have the benefit of a formal education in economics. Such a naïve group’s understanding of economic phenomena is shaped by a number of social and cognitive forces. Mapping the psychology of inflation involves “identifying the associations, explanations and causal reasoning utilized by the respondents as a function of their economic position and socialization” (Leiser et al. 2005:14). But ‘intra-psychological’ factors matter, too. Identifying the varied cognitive systems that inform naïve understanding is also important. In short: “Associations, heuristics, analogies to everyday experience, and understanding of economic phenomena all have their place in an account of the meaning of inflation to lay persons” (Leiser et al. 2005:14). By means of summary, these interventions show that respondents’ perception is that inflation consists in high(er) prices and its result is a lower value of the currency and devaluation. However, the most important result here were the missing concepts by respondents: salaries, industry, unemployment and the government. The results showed that across the four groups the depth of understanding, the concepts and the complexity of the explanations were very different. More than 80 per cent of the explanations for the links offered by the respondents lacked depth or were not well thought through.

Leung (2009) attempts to find explanations for why New Zealand’s (1000 strong) household surveys of inflation expectations consistently find over-predictions of inflation. Leung (2009) sets out comparable studies elsewhere including in South Africa, where she references the BER studies (Kershoff, 2000) which found that ‘the inflation expectations of lower income and younger households are lower, and [that] there was no difference amongst households of different education (2009:36). Her findings show that (in terms of age) the young have a higher upward inflation bias, that (in terms of ethnicity) respondents of [what she refers to as] non-European ethnicity had a much higher inflation bias relative to [what she refers to as] Europeans, that (in terms of gender) females had a higher inflation bias than males, and that finally (in

terms of income) increases in real income reduced inflation bias, as did skill levels. She accepts that some of these variables may reflect differences in the awareness of economic issues, based for example on the ‘tone’ of media reports, which show that the more highly educated were more responsive to media reports about inflation issues. (2009:38). From a policy perspective this may suggest that the New Zealand Reserve Bank could potentially “ ... bring down the overall inflation bias of households with education efforts targeted towards those groups with the greatest bias in their perceptions” (2009: 41).

In a number of papers, Simon Kemp has studied the impact of time, dating and remembering on how samples of residents gauge price changes. In a study of 150 German residents Kemp (1991) found that these residents estimated the previous year’s prices rather accurately but overestimated those of 15 years previously. In a 1987 study, 271 Christchurch residents underestimated the cost of the previous year but the prices of 15 years were overestimated (Kemp, 1987). These results were consistent for both general and specific items. The conclusion appears to be that past price changes are fairly accurately recalled for the near past but not remembered but estimated in a general way for dates in the more distant past. Kemp suggests that expectations of future price rises were linked to such general estimations of past price rises. (1987).

Dixon et al (2014) also use a large data set to assess lay people’s responses and sentiments to a number of issues related to the economy, including prices and employment. They infer bivariate relationships from respondents answers and their most striking findings is the strong correlation between the survey question dealing with perceptions of unemployment and the responses to the question dealing with expectations of future economic conditions, the association between prices and unemployment expectations is positive and consistent with the ‘good-begets-good heuristic for the majority of the months in the sample period (2014:9).

It is necessary to point out that the question they ask about prices is about the level rather than the rate of price changes. However, they claim support from the Raynard et al (2008) study summarised above, who conclude that “(t)he main insight from the

review is that while consumers may have a limited ability to store and recall specific prices and even succumb to a number of biases in the way in which they form perceptions and expectations of global price changes, they do seem to have some feel for, and ability to judge and forecast inflation” (2008: 397).

Biau et al (2010) argue that Euro area consumers hold very different opinions of inflation, reporting that “ ... perceptions and expectations of inflation range from high, or in some cases very high, to low and close to the official rate of inflation” (2010:ii). Generally Euro consumers overestimate inflation perceptions and they tend to do so by more than evidenced in comparable surveys outside the Euro area. Why this is so is not clear. Respondents reveal different perceptions and expectations depending upon income, age, education and gender. However, there remain questions about the data and the design of the survey questionnaire, which had included open ended questions related to ‘consumer prices’, and failed to probe unusual/outlier responses.

Issing (2006: 211) also highlights the fact that respondents in the Euro area overestimate inflation perceptions and points out that problems with perceived inflation in the European Union have been exacerbated since January 2002, i.e. from the introduction of a single European currency (2010:213). Among the reasons for this perception, Issing (2010:214) states that some consumers still use historic prices at the time of currency conversion as reference for price levels, thus discarding moderate inflation over the ensuing period.

Antonides analyses data from Eurostat and the EU Business and Consumer Surveys to show that significant correlations were found between perceived inflation and the rate of price changes in the EU as a whole and in a number of member countries (2008: 429). Perceived inflation was to some extent “ ... explained by different item category price changes in different countries, including transportation, communication, clothing, health and restaurants.” (2008: 429-30) Price changes for items including food and drinks, furniture and appliances did not significantly explain inflation perceptions in the selected countries, despite the weight of these categories in the Laspeyres price index, suggesting that consumers inflation perceptions are based on price changes of some

highly selective consumer items, in contrast with the Laspeyres price index weighting price changes by the budget shares of consumers. (2008: 430).

Forsells and Kenny (2002) also use the EU Consumer Survey to assess the rationality of inflation expectations in the Euro area, and conclude that consumer expectations provide “ ... important information on actual future developments in euro area inflation. In particular they provide an unbiased predictor of inflation one year ahead, and most strikingly, correctly anticipated the trend decline in inflation over the 1990s” (2002:5) . More generally they find ‘growing’ rationality in euro area inflation expectations in the 1990s compared with the 1980s. This may be because consumers in the Eurozone have become better at predicting inflation. But less volatile inflation and greater ECB credibility may also make it easier to predict future inflation.

2.3 On South African literature

In a South African context, Rossouw et al (2008) reported the results of a survey of inflation perceptions and the accuracy of past inflation figures among central bank employees, in that case the South African Reserve Bank. South Africa followed at the time of the survey (and still follows) an inflation-targeting monetary policy framework, with the central bank entrusted with the mandate of ensuring that inflation remains within the target range of 3 to 6 per cent per annum. Despite this mandate, the survey among central bank employees showed clearly perceptions that the actual rate of inflation was higher than the rate reported by the authorities. This showed a lack of credibility at the time of the survey in the very policy anchor that the central bank had to use among its own employees. This raises serious questions about any expectations of the general public to perceive the inflation rate as an accurate indicator of price increases.

Monique Reid has adopted an existing methodology, using market data and not surveys, during the 5 year period immediately after the SA Reserve Bank switched to inflation targeting to measure the sensitivity of South African inflation to macroeconomic surprises. She finds that the degree of sensitivity of local inflation expectations in the period under review is comparable to international standards, i.e. financial markets react less sensitively to macroeconomic surprises. This suggests that

the monetary authorities are communicating well with the public in anchoring inflation expectations, but she warns that as credibility is not a one off exercise – continuous efforts are required to promote sound communication with financial markets through transparent and predictable monetary policy. (2009, final page, unnumbered).

In a later paper, Reid (2012) analysed the formation of inflation expectations among the general public in South Africa, ‘ ... who are responsible for the majority of the price setting behaviour in South Africa ... ‘ (2012:4) to assess how the central bank can improve its communication with this group in an attempt to influence their inflation expectations. Reid concludes that “ ... financial analysts adjust their inflation expectations quicker and more accurately than price setters (2012:31). This provides evidence of “sticky” inflation expectations, with the general public responding with a lag to central bank communication and information on inflation.

To summarise, people who were more active in the economy or had a relevant education (economic students) were more likely to have an understanding closer to the economists view. All groups also showed a degree of understanding that was in line with the expert view. Therefore, even the basic model that individuals construct can inform adaptive decision making.

Our brief and necessarily limited survey of a vast and varied international and South African literature suggests that while inflation expectations are indeed anchored in perceptions of price changes (historic prices) such perceptions are themselves impacted upon by a wide range of factors which include both economic phenomena such as income, demographic factors such as age and gender, as well as social and psychological considerations such as trust, justice, and personality. Moreover, “reference pricing” as identified by Issing (2010) can play a role in perceptions, e.g. the date of conversion from one currency to another. However, if central bank officials, who are entrusted the responsibility of exercising the mandate of containing inflation in terms of an inflation targeting monetary policy as is followed in South Africa, report perceptions of actual inflation exceeding official inflation figures, it really begs the question whether low inflation perceptions among the general public should not be viewed as the rule, rather than the exception.

3. Inflation perceptions and inflation expectations

The 2014-survey discussed in this paper followed the same basic design as previous inflation perceptions surveys in South Africa and the BER's inflation expectations surveys in question design. Respondents were provided with the average inflation rate of the past five years and of the past 12 months before they were asked to give their perception of inflation over the past 12 months and their expectations of future inflation. It was the first time in South Africa that the same respondents were asked to respond on "both sides" (past perceptions and future expectations) on their views on inflation. The perceptions of past inflation of each respondent could therefore be linked to the expectation of future inflation of the same respondent. It is accordingly possible to show the degree in which inflation expectations are linked in inflation perceptions.

The survey results indeed show such a link. In South Africa expectations of inflation of respondents (consumers) are linked to their inflation perceptions. Field work for the survey was done between 16 September 2014 and 24 October 2014. Table 1 shows the exact question that was posed to respondents.

3.1 Don't know responses

Of those that responded to the 2014-survey on inflation perceptions and inflation expectations in South Africa (the first and only such survey), around 37 per cent responded "don't know" to the questions on their views on inflation in South Africa. Compared to the results of Jonung (1981), who reported a 20 per cent "don't know" response rate, this is quite high. According to Ranyard et al (2008) this indicates that a significant proportion of respondents had no or limited knowledge of the inflation rate.

The incidence of "don't know"-responses to surveys on matters pertaining to inflation is not new one in a South African context. Kershoff (2000) pointed out at the time of the first survey on consumers' inflation expectations in South Africa, undertaken in 2000, that "don't know" responses in that survey amounted to 17,2 per cent of respondents.

The incidence of “don’t know” responses in South Africa in general, and in the joint inflation perceptions/inflation expectations survey of 2014 is also evident from other surveys, with large margins of difference in such responses as percentage of the sample size. At the one extreme Kokoszcznski et al (2010) reported on the incidence of “don’t know” responses in inflation perception and inflation expectation surveys undertaken in the period 2001 to 2005 in the Czech Republic, Hungary, Poland and Slovakia. The highest incidence of ‘don’t know” responses for inflation expectations was reported at 9,9 per cent in the Czech Republic, although it went as low as 3,3 per cent in Slovakia (Kokoszcznski et al 2010:80). For inflation perceptions an even lower incidence of “don’t know” responses was reported, going as low as 1,3 per cent in Hungary (Kokoszcznski et al; 2010:79).

To the contrary, M&G YouGov⁶ reported high percentages of “don’t know”-responses to a question “(w)hat annual rate of inflation do you expect 12 months from now?” (2014:4). They reported these responses as 35,4 per cent in Austria, 56,8 per cent in France, 30,6 per cent in Germany, 17,4 per cent in Hong Kong, 35,4 per cent in Italy, 19,3 per cent in Singapore, 39,9 per cent in Spain, 36,2 per cent in Switzerland and 34,1 per cent in the United Kingdom, (2014:4). They reported even higher rates of “don’t know”-responses to the question “(w)hat annual rate of inflation do you expect five years from now?” (M&G YouGov, 2014:4), peaking at 64,3 per cent in France.

No clear trend in “don’t know”-responses is discernible from international experiences, but 37 per cent of respondents reporting in the 2014-survey in South Africa that they “don’t know” is aligned to the range of responses reported by M&G YouGov (2014).

A probit selection equation was estimated to predict the probability of the respondent answering the inflation perception and inflation expectations questions based on their demographic characteristics (see Table 2). The dependent variable is a dummy variable, where 0 represents non-response and 1 response. The rest of the independent variables are all dummy variables. These include age of the respondents, population group,

⁶ M&G YouGov’s *Inflation Expectations Survey* is a survey undertaken quarterly on behalf of M&G Investments by YouGov, an international market research agency specialising in various sectors of the economy. See M&G YouGov (2014:8) for more detail.

gender, employment status, education, income, province and marital status. The baseline chosen are those aged 25 -34 years old, black population group, male, full time employed, completed matric with an income of R800 to R3999 in Gauteng province who are single.

From the results, those older than the reference group (25-34) were less likely to have an actual response to both the inflation perception and inflation expectation question. Compared to African respondents, white respondents were more likely to have an actual response to both questions. Interestingly, retired respondents were significantly more likely to give a response to inflation expectations, compared to the full time employed. In terms of education, respondents with a technical qualification as well as who were professionals were more likely to provide an inflation perception and inflation expectations response. Those in the highest income category (R8000+) were more likely to provide an actual inflation perception figure, compared to those who earned between R800 – R3999. Both the R4000 – R7999 and the R8000+ group were more likely to provide an inflation expectation figure. Compared to Gauteng, people residing in the Western Cape, Free State, North West province and Limpopo were more likely to give an inflation perception as well as inflation expectations response, while households residing in the Eastern Cape, Northern Cape and KZN were less likely. Lastly, compared to single respondents, separated persons had a lower likelihood of providing an actual inflation perception response.

3.2 Results from the 2014 Survey

The average perceived inflation rate of those who did answer the question in the 2014-survey in South Africa was higher than the official inflation rate at 8,5 per cent, compared to the actual inflation rate of 5,9 per cent. Figure 1 shows the distribution of responses for both the inflation perceptions and inflation expectations questions. From the spike in inflation perceptions, it seems that inflation perceptions are more contained around the 5 to 6 per cent level, compared to inflation expectations.

Male respondents had a higher inflation perception, compared to females. This is contrary to the finding of Jonung (1981), who showed that females perceived inflation to be higher than males and ascribed this finding at the time to the fact that women were more exposed to food prices and increases in such prices than men. Kemp (1987), however, found that increased familiarity with specific prices tended to result in less accurate estimates of past prices for the item in question.

According to Ranyard et al (2008) individual households may not experience inflation as measured by CPI, which may be biased towards the upper percentiles of the expenditure distribution, rather than to reflect price increases for those who are at the bottom. Inflation rates for different products vary considerably, so lower income households may purchase more food items which could have a lower weight in the overall CPI basket as it measures the average expenditure on food (as opposed to the share of income spent on the item). These lower income households therefore may have a tendency to overestimate their own inflation compared to the overall rate of inflation in a jurisdiction, which includes price increases for all income groups.

Some evidence of grounds for higher inflation perceptions by low income groups in South Africa is reported by Rossouw (2015). Rossouw (2015) assessed the accuracy of South African inflation data since 1922 by adjusting historic prices recorded for selected food items, household consumables and clothing since 1922, 1974 and 2006 for inflation since those dates and comparing the adjusted prices to the current prices of the same items. Prices increased broadly in accordance with the inflation rate since 1922 and 1974. To the contrary, the rate of inflation broadly underreports price increases since 2006 for most items in all classes of goods compared. As the prices used in the comparison (in the main food and clothing prices) have a comparatively higher weight in the expenditure basket of the low income group, Rossouw (2015) concludes that the poor suffers as a consequence of sustained and underreported inflation. Moreover, the analysis provides grounds for perceptions that historic price increases exceed price increases reported by the inflation rate.

Figure 2 shows that respondents in the highest income quintile perceived and expect lower inflation, compared to those in the lower income categories. These results mirror

results found by Bryan and Ventaku (2001b). Respondents in the lower income groups had similar CPI inflation outcomes (as printed by Stats SA) as those in the higher income groups over this period, suggesting that respondents in the lower income quintile perhaps experience higher levels of actual in-the-store inflation. Figure 3 illustrates the differences between inflation perceptions and actual income-quintile-specific inflation rates. It is evident that both the perception and expectations bias is higher amongst the lower income quintiles. This result was also found by Leung (2009). Interestingly, at the top two quintiles, inflation expectations bias is much larger than inflation perception bias, while in the bottom quintiles, the biases are more similar. This could be that lower income respondents experience higher prices, and therefore their perception bias is higher than their expectation, while higher income respondents do not experience higher prices than inflation, however, they have more information available to them and can price inflation expectations in to their environment (see figure 4 and table 3 for CPI price data).

Ranyard et al (2008) also argue that incomes impacts on inflation perceptions, as a respondent may perceive to be less affected by a price increase if the person has also had an increase in income. Fisher (1986) conceptualised this as if prices are perceived to increase faster than income, people will experience a decrease in their well-being. Garling and Gamble (2006) [put into own words here], showed that average inflation were perceived to make products more expensive, unless income increased simultaneously.

Table 4 reports the average inflation perceptions and expectations by how well respondents believed Government⁷ is containing inflation. The result show that households who felt that Government was not containing inflation “at all well” reported inflation perceptions of around 1,9 times that of those who believed Government was doing “very well”. For inflation expectations, respondents who felt that Government was not containing inflation “at all well” reported inflation perceptions of around 1,6 times that of those who believed Government was doing “very well”. These results

⁷ Although the term Government is not technically correct as the Reserve Bank is instrument independent, households generally refer to policy makers as Government.

gives merit to the findings by Bastounis et al (2004) who found that respondents who generally expressed satisfaction with the economic system tended to support business initiatives and activities as a means to fight inflation, even though they tended no to support government interventions such as price control.

Table 5 contains a summary of inflation perceptions and expectations by various demographic characteristics of the respondents. According to Bryan and Venkatu (2001a) and Leung (2009) whites [or European ethnicity] perceived and anticipated lower inflation compared to non-whites [or non-European ethnicity]. Our results show that White and Black respondents had similar inflation perceptions, which were higher than those who were Indian or coloured. However in terms of inflation expectations, Black respondents had the lowest average inflation expectations.

Our results differ largely from Bryan and Venkatu (2001a) and Leung (2009)'s when analysing inflation perceptions and expectations by age groups and marital status. Our findings show that middle-aged respondents perceive and anticipate higher inflation than young respondents. Furthermore, married respondents perceived and expected higher inflation, compared to single respondents. Interestingly, divorced respondents reported a much higher average inflation expectations rate than the other respondents. In practice divorced respondents could have more incentive to have a higher view of inflation, as they usually form part of legal financial settlements.

When looking at respondents responses by highest level of education (or in other words skill levels), those who completed only matric as their highest level of education had the highest perceptions and expectations. Interestingly, students had the lowest perceptions and expectations. This could be due to perhaps a lack of inflation experience or relying on someone else to make purchases for them.

3.3 Inflation perception and expectation bias

Figure 5 plots each respondent's perception error on one axis against the respondent's expectations error on the other. It shows that there is a relatively strong correlation between the two errors at lower values of the errors. The average ratio between the two

were below one, indicating that the degree of bias in estimating current inflation is less than that of estimating one year ahead inflation. Leung (2009) suggests that this is most likely due to people having more information on current inflation than future inflation. There seems to be a recognisable difference between household income quintiles and person income quintiles. However, it should be noted that of the person income question, there were 46 per cent non-responses or no income, while for the household income question there were only 29,3 per cent non-responses or no income responses.

Inflation perception Bias = Inflation perception – actual inflation

Inflation expectations Bias = Inflation expectations – actual inflation

We use an OLS regression to determine the impact of demographic characteristics on inflation perception and inflation expectations bias (see table 6). Compared to males, female inflation perceptions bias was lower. Similarly, compared to full time employed, part-time employed, housewives, students and unemployed had a lower bias. Compared to those with some schooling up to and including matric as highest education level, all other qualifications had a lower bias. Those in the highest income group also had a lower perception bias, compared to those in the R800 to R3999 category. KZN had a higher perception and expectations bias, compared to Gauteng.

3.4 Inflation perception feed through to inflation expectations

Jonung (1981) found a significant positive correlation coefficient between perceived and expected inflation of about 0,5. A similar result was reported by van der Klaauw et al (2008) for the US. We found a positive and significant correlation coefficient of 0,76 when using the spearman's rank correlation test, where the H_0 states that the variables do not have a rank-order relationship. At the one per cent level we reject the H_0 , and we conclude that higher inflation perceptions do lead to higher inflation expectations.

Table 7 shows that consumers' inflation expectations matched their inflation perceptions. Consumers who reported below 5,5 per cent inflation perceptions, mostly

also reported below 5,5 per cent inflation perceptions. Consumers who had higher inflation perceptions, mostly also had similar high inflation expectations.

4. Conclusions

This paper evaluates information on South African consumer inflation perceptions and expectations, against the backdrop of the South African Reserve Bank's inflation targeting regime with price stability as the main objective. The first goal which was addressed in our review of the literature was to explore the process of forming perceptions and expectations. Studies revealed that this process is a complex one informed both by economic factors as well as a range of social, psychological and political considerations. Universally, studies also found that the understanding of inflation by the general public was limited, and that inflation perceptions and expectations were closely linked to respondent's direct environment such as their feelings about their country's political regime, their exposure to economic decision making, their ability to accurately recall prices, as well as their economic position in society. Lower income earners tend to experience higher price increases as the weights of goods in their consumer basket is very different from the weights in the average consumer price index basket.

Our second goal was to introduce the results of the fourth round of a survey on inflation perceptions and inflation expectations in South Africa. This was the first round where the same consumer was asked about his view on historic prices, as well as his expectations of future price increases. It is of some significance to point out that this was also the very first time that this has been done in South Africa. The results firstly highlight the importance of "don't know" in inflation question responses. Those who were older than the middle-aged had a lower probability of responding to the inflation questions. White respondents were more likely to provide a response to the inflation questions, while retired consumers were more likely than full-time employed to give a response to inflation expectations. The probability of a response was also higher for respondents with a technical or professional qualification and for those in the higher income groups.

Third, we showed that the bottom income quintile likely experience higher prices than the official CPI, as they had much higher inflation perception and inflation expectations than the average CPI over the period (also when taking the CPI for each quintile). For the first time we can measure the impact of trust in the political regime in South Africa on inflation perceptions and inflation expectations. The results show that households who felt that Government was not containing inflation “at all well” reported inflation perceptions of around 1,9 times that of those who believed Government was doing “very well”. For inflation expectations, respondents who felt that Government was not containing inflation “at all well” reported inflation perceptions of around 1,6 times that of those who believed Government was doing “very well”.

Last, the paper was able to prove, again for the first time, that there is indeed a feed through from inflation perception to inflation expectations in South Africa. Therefore, inflation perceptions play a crucial role in the formulation of inflation expectations in South Africa. These results suggest that policy makers are not just charged with containing inflation expectations, but that they should also be vigilant that the confidence in official statistics, as well as the confidence in the Reserve Bank and government, impacts inflation perceptions which in turn directly feed into inflation expectations. The centrality of consistent, accurate and effective communication by the monetary authorities, as well as by government, in all matters related to information dissemination both about inflation and prices, and about general economic data cannot be over-emphasized. Innovative means of communication to reach low income earners with such information have to be developed, and we believe the results of succeeding in this latter objective may be very significant.

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Table 1: Inflation perceptions and expectations question 2014

<p>Inflation perceptions question QE1</p>	<p>Over the past five years prices increased by on average 5.5% per year. During 2013 prices increased by 5.7%. By about how much do you think prices in general increased during the past 12 months? Numeric insert 1- 90, 99=don't know</p>
<p>Inflation expectations question QE2</p>	<p>By about how much do you expect prices in general to increase during the NEXT 12 months? Numeric insert 1- 90, 99=don't know</p>

Table 2: Influence of demographic characteristics on probability of answering inflation questions

Characteristic	Inflation perception question		Inflation expectation question	
	Coefficient	Z-stat	Coefficient	Z-stat
16-24	0.128	0.990	0.104	0.800
35-49	-0.207	-2.060	-0.164	-1.610
50+	-0.433	-3.260	-0.379	-2.820
White	0.385	2.450	0.443	2.820
Indian	0.324	0.970	0.196	0.610
Coloured	-0.141	-0.980	-0.127	-0.890
Female	-0.073	-0.920	-0.007	-0.090
Part-time employed	0.004	0.030	0.023	0.180
Housewife	0.059	0.250	0.091	0.390
Student	-0.012	-0.060	0.008	0.040
Retired	0.181	1.030	0.275	1.600
Unemployed	0.060	0.510	0.014	0.120
No schooling	-0.273	-1.010	-0.281	-1.030
Technical qualification	0.264	1.960	0.205	1.510
Secretarial	-0.174	-0.300	-0.181	-0.310
Professional	0.486	2.350	0.468	2.460
Student	0.000		0.000	
R1-R799	-0.008	-0.060	-0.108	-0.890
R4000-R7999	0.108	0.990	0.150	1.410
R8000+	0.287	2.020	0.331	2.270
Western Cape	0.566	3.360	0.705	4.430
Eastern Cape	-0.290	-2.580	-0.324	-2.860
Northern Cape	-0.825	-4.160	-0.846	-4.310
Free State	1.288	5.330	1.321	5.390
KZN	-0.245	-2.230	-0.296	-2.710
North West Province	0.533	2.850	0.339	1.860
Mpumalanga	0.273	1.360	0.329	1.620
Limpopo	0.336	2.450	0.348	2.540
Married	0.131	1.160	0.113	1.000
Living together	0.167	1.270	0.107	0.820
Widowed	0.003	0.020	-0.122	-0.610
Divorced	0.194	0.650	-0.047	-0.160
Separated	-0.525	-1.640	-0.400	-1.250
Constant	0.257	2.070	0.198	1.620
Observations	1931		1931	
Pseudo R2	0.12		0.12	

Table 3: Average annual CPI inflation for income quintiles and total

	CPI per expenditure quintile 1: up to R21 399	CPI per expenditure quintile 2: R21 400 to R35 750	CPI per expenditure quintile 3: R35 751 to R61 624	CPI per expenditure quintile 4: R61 625 to R142 083	CPI per expenditure quintile 5: R142 084 and more	Total CPI
2009	9.0	9.1	8.9	8.0	6.6	7.1
2010	3.1	3.2	3.4	4.0	4.6	4.3
2011	6.0	5.8	5.6	5.7	4.7	5.0
2012	7.0	6.8	6.6	6.4	5.3	5.7
2013	6.3	6.0	5.9	6.1	5.7	5.8
2014	6.2	6.1	6.1	6.0	6.0	6.1

Table 4: Mean responses to how well would respondents say the government is handling the following? - Controlling inflation

Response options:	Perceptions	Expectations
Not at all well	12.2	12.3
Not very well	7.4	7.7
Fairly well	7.0	7.6
Very well	6.3	7.9
Don't know/ refused	7.7	8.0

Table 5: Mean inflation perceptions and expectations by demographic characteristics

	Perceptions	Expectations
Average	8.60	8.98
Male	9.00	9.46
Female	8.19	8.49
White	8.89	9.12
Black	8.78	8.84
Indian / Asian	6.66	9.97
Coloured	7.48	9.57
16 - 24	7.98	8.36
25 - 34	8.37	8.57
35 - 49	9.48	9.93
50+	8.62	8.97
Bottom 20%	13.19	11.73
40%	10.23	9.19
60%	9.38	8.89
80%	6.28	7.15
Top 20%	6.82	7.22
Working full-time	9.37	9.96
Working part-time	8.03	8.03
Not Working - Housewife	7.85	7.86
Not Working - Student	8.42	8.52
Not Working - Retired	8.08	8.92
Unemployed - looking for work	8.83	9.09
Unemployed - not looking for work	5.78	6.42
Single	8.32	8.65
Married	9.01	9.49
Living together	7.95	8.38
Widowed	9.93	9.43
Divorced	9.51	13.03
Separated	4.97	4.73
Western Cape	6.9	8.5
Eastern Cape	6.9	7.1
Northern Cape	11.1	9.4
Free State	23.9	21.6
KwaZulu Natal	6.0	6.4
North West	5.1	5.1
Gauteng	8.4	10.3
Mpumalanga	13.9	9.4
Limpopo	4.9	5.8

Table 6: Influence of demographic characteristics on average inflation perception bias

Characteristic	Perception-actual		Expectation-actual	
	Coefficient	T-stat	Coefficient	T-stat
16-24	-0.522	-0.500	0.558	0.510
35-49	-0.129	-0.120	-0.092	-0.100
50+	-1.470	-1.190	-1.332	-1.230
White	1.113	0.840	0.684	0.530
Indian	-0.448	-0.390	2.209	0.800
Coloured	1.152	0.890	-0.029	-0.030
Female	-1.023	-1.330	-0.968	-1.470
Part-time employed	-3.085	-2.360	-2.504	-2.490
Housewife	-2.769	-1.710	-2.574	-1.830
Student	-2.934	-2.240	-3.888	-3.250
Retired	-0.300	-0.170	-0.743	-0.490
Unemployed	-4.346	-3.470	-4.474	-4.050
No schooling	-4.012	-2.020	-2.530	-1.620
Technical qualification	-2.736	-3.700	-3.037	-3.890
Secretarial	-2.861	-1.350	-3.508	-1.620
Professional	-5.094	-4.350	-4.796	-3.940
Student	-7.837	-5.380	-9.377	-5.880
R1-R799	-0.290	-0.280	-0.307	-0.310
R4000-R7999	-1.323	-1.200	-0.652	-0.570
R8000+	-1.723	-1.460	-1.271	-1.020
Western Cape	-2.519	-3.250	-1.770	-2.270
Eastern Cape	-0.834	-0.640	-1.121	-0.960
Northern Cape	1.497	0.380	-0.170	-0.080
Free State	13.674	4.860	10.872	4.480
KZN	-1.616	-2.440	-1.438	-1.720
North West Province	-1.906	-2.420	-2.777	-3.420
Mpumalanga	3.623	1.900	0.119	0.090
Limpopo	-2.071	-3.030	-1.689	-2.360
Married	0.545	0.460	1.768	1.770
Living together	0.209	0.170	0.365	0.390
Widowed	4.159	1.370	3.798	1.590
Divorced	0.516	0.400	0.729	0.550
Separated	-4.029	-0.700	-2.287	-0.470
Children younger than 15 in household	-0.162	-0.210	-0.911	-1.290
Constant	5.133	4.030	6.137	5.810

Table 7: Inflation perceptions and expectations – comparative shares

Perceptions categories	Expectations categories					
	1%-5,5 %	5,6%-10%	11%-15%	16%-20%	21% plus	Total
1%-5,5 %	78.7	20.0	0.2	0.0	1.2	100.0
5,6%-10%	12.5	80.2	4.8	0.8	1.7	100.0
11%-15%	2.7	15.0	60.4	8.9	13.0	100.0
16%-20%	6.0	10.1	0.0	17.7	66.2	100.0
21% plus	1.9	5.5	4.7	9.3	78.5	100.0
Total	40.2	48.2	3.8	1.2	6.7	100.0

Figure 1: Distribution of inflation perceptions and expectations 2014

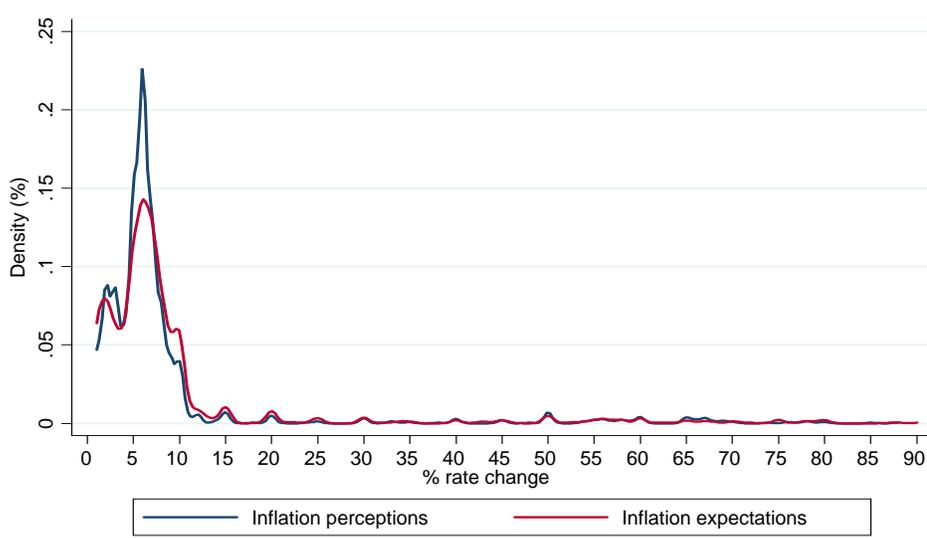


Figure 2: Inflation perceptions and expectations by household income quintiles vs actual inflation outcomes

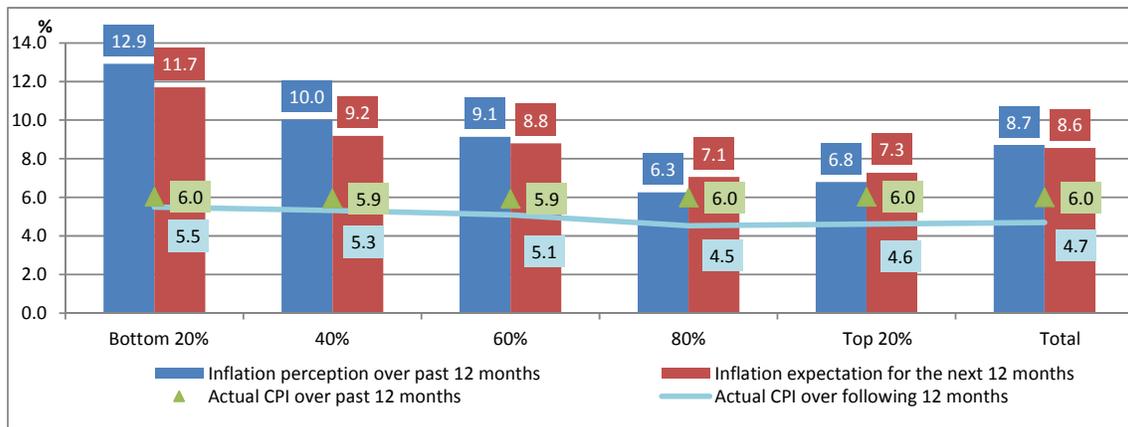


Figure 3: Differences between inflation perceptions and actual historic inflation and expectations and actual inflation outcomes by household income quintiles

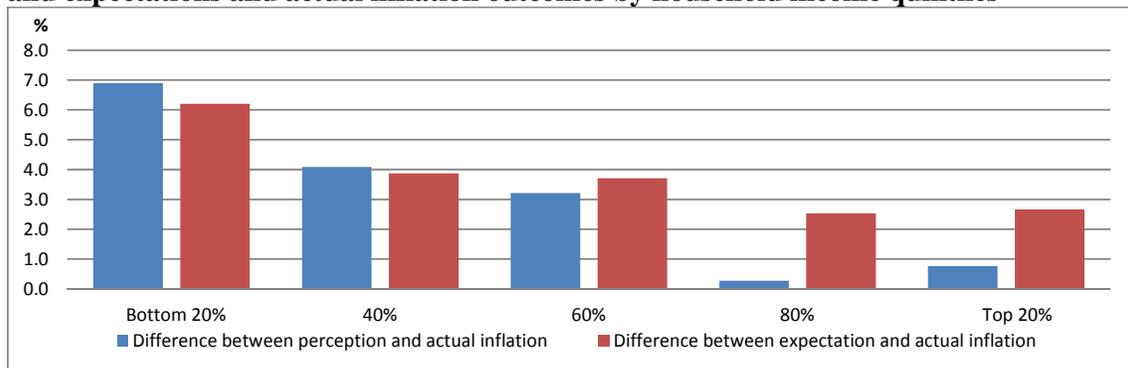


Figure 4: Historic inflation by expenditure (income) quintiles

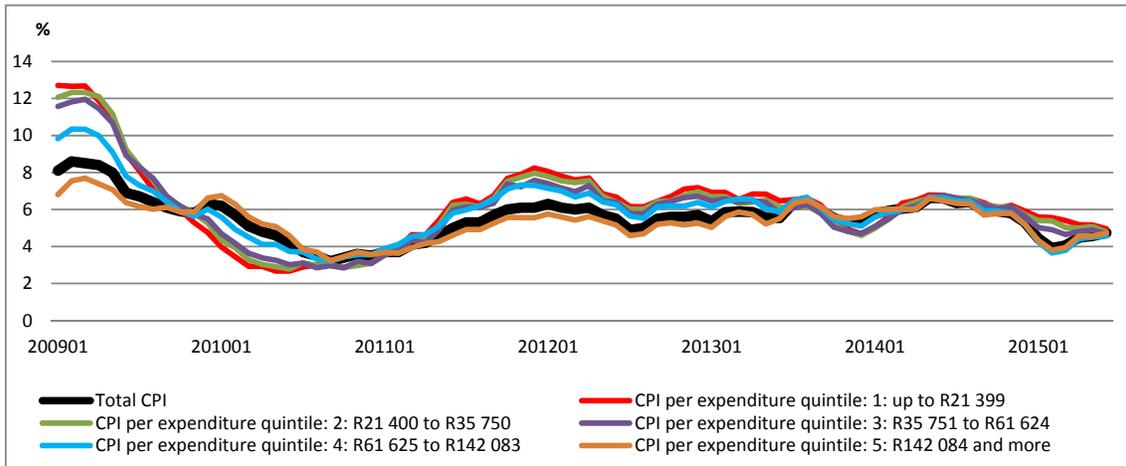


Figure 5: Estimation error on current inflation and estimation error on expected inflation 2014

