Information content of household inflation expectations surveys

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Preliminary draft - please do not quote

1. Introduction

The role of the expectations channel of the monetary transmission mechanism, which was well established before the financial crisis of 2007/2008, was further elevated during and since the crisis when conventional monetary policy tools lost their potency. In theory, if central bankers are able to use communication successfully, inflation expectations should be well anchored to an inflation target (whether or not the country formally adopts an inflation targeting framework). Inflation expectations provide insight into inflationary pressure that impacts on the future unfolding of the inflation within the economy, and given that monetary policy is necessarily forward looking (Friedman, 1968) it is reasonable for policy makers to target forecasts of inflation. It is therefore unsurprising that many central banks monitor developments in inflation expectations closely.

These expectations are typically measured in one of two ways. Firstly, the inflation expectations of financial market participants can be derived from their behaviour as reflected in asset purchases. Often break even inflation rates (the difference between the yields on nominal and inflation-linked bonds) are used, as in the case of the Monetary Policy Reviews of the SARB. If a series of these bonds are used to estimate yield curves, then forward inflation compensation rates can be derived to provide more accurate measures of inflation expectations at various horizons along the yield curves. The advantages of the market-based measures include the high frequency and accuracy of these measures (SVENSSON, 1997), using data which offer large sample sizes. The second approach to measuring inflation expectations consists of survey data. While survey data has the disadvantages that it has lower frequency and usually relies on much smaller samples, it does enable researchers to measure the expectations of groups in society other than financial market participants to which the asset prices are limited.

In 2008, Blinder et al called on researchers to begin to investigate the inflation expectations of the non-financial markets segments of the general public because they give the banks 'the democratic legitimacy, and hence their independence' (Blinder, 2008) (Blinder, 2008:58). More recent research adds that the differences that exist between the inflation expectations of households and financial market participants have economic implications that are not negligible (Coibion, 2015), and several central banks have conceded that communication needs to be tailored specifically to this non-specialist audience (Binder, forthcoming). In this paper we will focus specifically on the survey data of the inflation expectations of South African households, as collected by AC Nielsen on behalf of the South African Reserve Bank (SARB) and the Bureau for Economic Research.

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Despite the potential relevance of these expectations to the implementation of monetary policy, given that they may provide insight into the inflation expectations of price setters in the economy, this household survey data receives very limited attention, even from the SARB who contracts the Bureau for Economic Research to manage the collection of this data. From a policy perspective, the results suggesting the economic relevance of studying the inflation expectations of households separately raise a number of questions about the household survey figure collected by AC Nielsen for South Africa: (1) Do inflation expectations within South African households differ markedly across demographic groups? (2) Which of these groups is more responsible for the inflationary pressure that is relevant to decisions about the policy rate? (3) Are the inflation expectations of some groups better anchored than others? and, (4) Why do they differ, beginning with a questions of which sources of information the different groups rely on?

In this paper, we begin to answer some of these questions using demographic data to ask how different groups within the population of households influence the aggregate inflation expectations figure published. Against this characterisation of the survey composition, we consider the motivation for conducting such a survey and begin to assess to what extent this survey is suitable for the purpose it is being used for.

2. Motivation for monitoring household inflation expectations

Central banks communicate with households for two reasons – to maintain democratic accountability and to anchor their inflation expectations. Surveys such as the survey of South African households' inflation expectations[4], launched in 2000 shortly after the adoption of inflation targeting, are typically used to monitor inflation expectations to achieve the second objective.

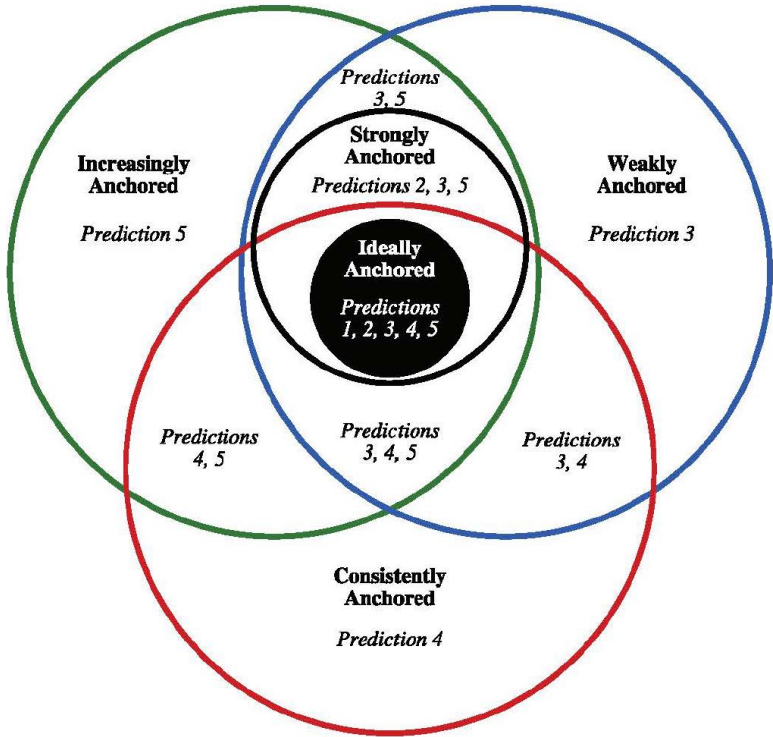### a. Anchoring inflation expectations

While a range of proxies are used in empirical studies to capture the extent to which inflation expectations are anchored, this concept is often not clearly defined so that we can distinguish between these measures used in the literature. Kumar et al (2015) provide a systematic way to formalise different ways of defining anchored expectations, represented graphically by figure 2.

Kumar et al (2015) identify five different definitions of anchored expectations in the literature:

i) Inflation expectations are *ideally anchored* when the average expectations are close to the target.

ii) Inflation expectations are *strongly anchored* when they are not excessively dispersed across agents.

iii) Inflation expectations are *weakly anchored* when agents show confidence in their forecasts, in that they believe that the range of likely outcomes will not be far from the forecast they made.

iv) Inflation expectations are *consistently anchored* when agents make small forecast revisions.

v) Inflation expectations are *increasingly anchored* when changes in short run expectations do not predict changes in long run expectations.

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[4] See Kershoff and Laubscher (1999) for a summary of the international usage of these surveys. A more recent survey will be available shortly from Hugo Pienaar at the BER.

Figure 2: Definitions of Anchored Expectations

Predictions 3, 5

Strongly Anchored
Predictions 2, 3, 5

Increasingly Anchored

Prediction 5

Ideally Anchored
Predictions 1, 2, 3, 4, 5

Weakly Anchored

Prediction 3

Predictions 4, 5

Predictions 3, 4, 5

Predictions 3, 4

Consistently Anchored

Prediction 4

a. This diagram shows how the five definitions of anchored expectations, and their predictions, relate to one another. Causality is established in the sense that if expectations are ideally ε_τ-anchored for all $\tau \geq 0$ given an arbitrary sequence of $\{\varepsilon_\tau\}_{\tau=0}^{\infty}$, then expectations are also strongly, weakly, consistently, and increasingly anchored according to $\{\varepsilon_\tau\}_{\tau=0}^{\infty}$, up to a scale.

If being ideally anchored is the full definition of anchoring, then the other 4 can be presented as characteristics or components of this ideal anchoring. Independently, these weaker characteristics of anchoring do not ensure anchoring in the full sense.

b. Household inflation expectations – why study them separately?

(Coibion, 2015) and (Binder, 2015b) use household inflation expectations numbers to re-estimate the Phillips curve for the USA and find that (1) it explains the 'missing disinflation' and that (2) The inflation expectations of high-income, college-educated, male, and working age people play a larger role in inflation dynamics than do the expectations of other groups of consumers or of professional forecasters. In South Africa, with the high level of inequality, it is also likely that some segments of the population have a disproportionately large impact on the inflationary pressure within the economy to which policy makers need to respond.

If these groups can be identified and characterised it will allow further research into the degree to which the expectations of these different groups are anchored and the sources of information they rely on.

3. What should the survey numbers measure?

Well created data should be both reliable (consistent) and valid (accurately measure the characteristic of interest, the truth). Reliable data is data that can be replicated under various conditions, whereas the validity of the data concerns the extent to which the data accurately measures what it claims to measure (Krippendorff, 2013). Krippendorff (2013: 269) used figure 1 to

clarify the relationship between these two criteria. In figure 1, validity increase as we move up the vertical axis and reliability increases as we move to the left on the horizontal axis. The target in the lower, left hand corner of the figure represents the case of perfect reliability but without validity, in that all the shots were identical but inaccurate. The target in the top right hand corner in contrast represents validity without a high degree of reliability, as the shots are clustered around the true centre but the clustering is not tight. In summary, reliability increases the chance of validity, but it does not guarantee validity.

Figure 1: The relationship between reliability and validity
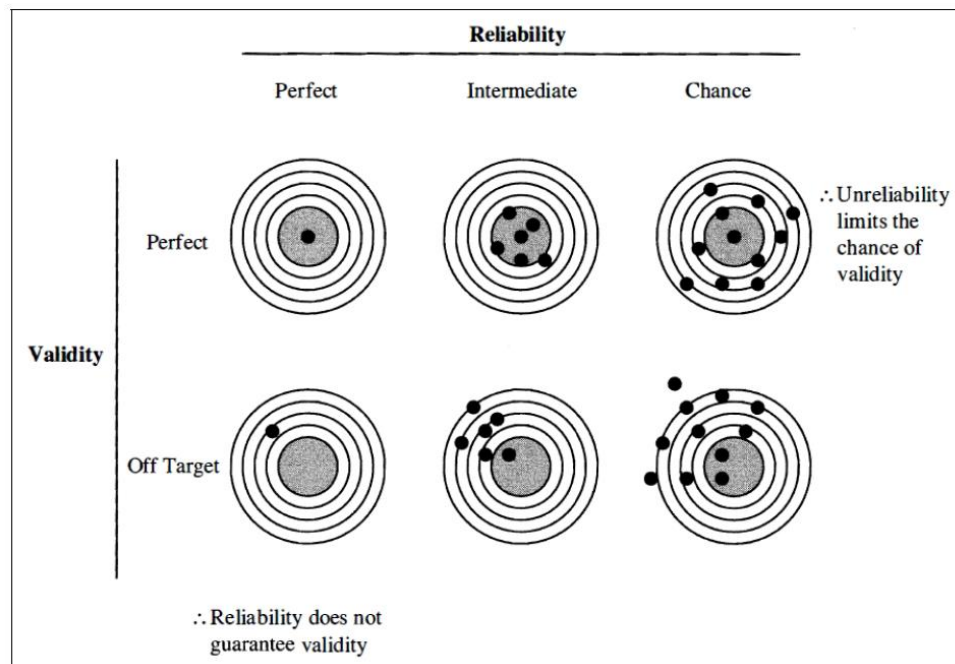
Source: Krippendorff (2013: 269)

In this regard, the South African household survey data is collected on behalf of the BER and SARB by a reputable marketing research firm, AC Nielsen. In pursuit of reliability, A.C. Nielsen need to ensure that data 'remain constant throughout variations in the measuring process' (Kaplan and Goldsen, 1965). They do so by, for example, using a range of well-trained interviewers and interviewing a large, demographically representative sample of 2500 respondents (Nielsen, 2017). However, although reliability increases the chance of validity, it does not guarantee it - a factor can be consistently mis-measured resulting in data that does not represent the characteristic of interest. Validity is more difficult to demonstrate and can take on a number of characteristics.

After reviewing a range of classifications of different types of validity, Krippendorff (2013:332, italics not in original) concludes that 'all empirical validation efforts enlist *evidence* and *established theories* to ensure that research results are taken seriously.' More specifically, a classic distinction between forms of validity ((Association, 1954), (Krippendorff, 2013), (Litwin, 1995)) would be the following:

- Content validity is evaluated by a group of subject experts, who assess whether the measure captures all the features of the construct it aims to measure ((Krippendorff, 2013), (Litwin, 1995)).
- Criterion-related validity, which is sometimes divided into sub-components - concurrent validity (where the measure is compared with another measure, preferably a 'gold standard')

and predicative validity (the ability of the structured measure to forecast future events). In both cases a correlation coefficient between the two measures is typically used to evaluate criterion validity.

- Construct validity establishes whether the constructed measure behaves as the theory predicts the underlying (or latent) variable does.

In the case of the BER's household inflation expectations survey (as well as many other international equivalents), there is reason to question validity along some of these criteria. Some preliminary indications of this is the fact that household survey features so infrequently in the Monetary Policy Reviews of the SARB in the period 2012 – mid-2016 compared to the BER's inflation expectations surveys of financial analysts, trade unions and the business sector[5]. Could this be a result of the fact that it does such a poor job of forecasting inflation? Or at some level it is being judged to be less informative about inflation.

While there are indications that the household data is not treated with the same confidence as the surveys of the other three groups, it is not easy to establish the validity of this measure. This household survey question is based on that of the international leader in this regard – the University of Michigan survey of consumers (Michigan, 2017) and there is no question that a range of subject specialists would've considered the content validity of the question. There is of course no guarantee that they did not overlook a consideration so this could reasonably be reviewed if such a new argument is presented. With regard to criterion-related validity, there isn't a gold standard alternative in this case to compare this measure to in order to establish concurrent validity[6], but it is possible to try estimate the extent to which the survey results forecast future inflation in order to establish predictive validity. Finally, construct validity requires that the empirical evidence is not at odds with the theoretical expectations of how this measure should behave.

In the case of the theoretical (economic) justification for the measure, to begin to establish both content and construct validity, it's necessary to clarify what a central bank does expect this measure to capture and how it would use it. Historically these surveys have been designed to measure the expectations about CPI of the full population of a country and the measure is then compared to actual CPI. While this seems like a natural comparison there are some differences between the two measures that may result in them being less compatible than they first appear. Besides the question of whether households understand CPI and therefore provide an informative answer about their views in the survey, historically, the inflation expectations surveys are typically designed to be directly comparable with the consumer price index against which the target of the central bank is set. STATSA adopts a plutocratic weighting rather than a democratic weighting to create the primary CPI index adopted in SA as the targeted measure of inflation. Plutocratic weighting involves averaging expenditure across the economy (abstracting from the question of who is spending this money) (Bhorat, 2005). This does not necessarily map well into the inflation expectations survey data, which adopts a democratic weighting (the inflation expectations of each household are weighted equally). Since inequality is so high in SA, this average across the representative sample is likely to be quite far from the officially targeted CPI index. In addition, if the respondents understood inflation reasonably

well then the average of their information might provide a sensible forecast of inflation, but since this is not the case, this average is not very informative.

If the aim of the survey was to measure the population's view of the credibility of a central bank and therefore the pressure that monetary institutions might face in a democratic country where each person has a single vote, then this approach would be reasonable. But if the survey is used to gauge the *inflationary pressure* that exists, in order to provide some insight into the likely future path of inflation in the economy, then perhaps a survey that equally weights the reported inflation expectations of a representative sample of the population does not accurately capture this pressure. The uncomfortable truth is that some people exert more pressure than others on prices as a result of their control of the economic assets with the economy.

In the sections that follow we present the data we use and then examine its characteristics and the socio-economic factors that influence the expectations. We then aim to ask whether some of these groups influence the inflationary dynamics more than others and the variance in anchoring of the expectations across these groups.

4. Data

The BER's household survey that we analyse is conducted by the marketing research firm A.C. Nielsen as part of their omnibus survey. They conduct face to face interviews of approximately 2500 households every quarter. For this paper, we were able to get access to the disaggregated data for 5 quarters, spread over the period 2006 – 2016. This is a rich set of surveys in that these surveys are spread over a range of economic contexts: in 2006 the SARB's policy rate (PR) is rising; in 2008 it is beginning to fall from its peak; in 2014 it is stable at a fairly low level; in 2015 it is rising again from a low level; and in 2016 it is near the end of a relatively long period of an unchanging PR level (figures 3 and 4). And in 3 of the 5 cases, inflation is outside of the target range (figure 2).

Headline inflation: South Africa
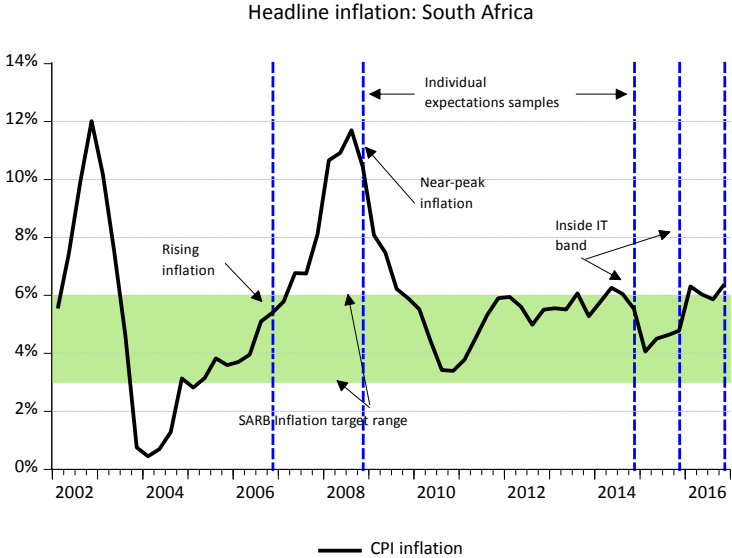
Figure 3: SARB's Policy Rate

Surveys
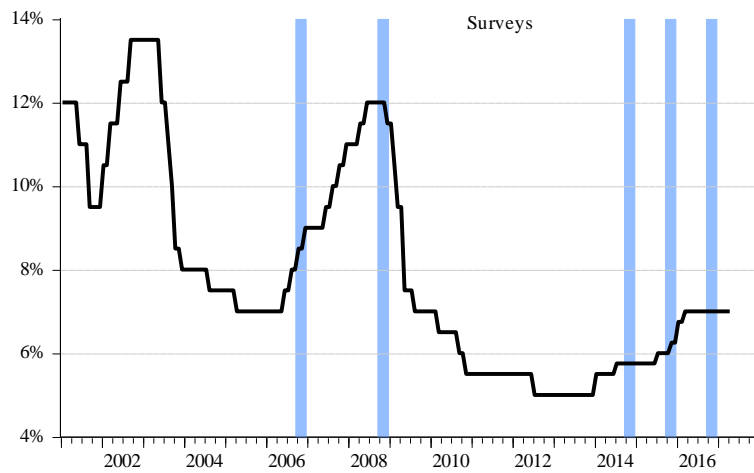
Figure 4: Changes in the SARB's Policy Rate

Surveys
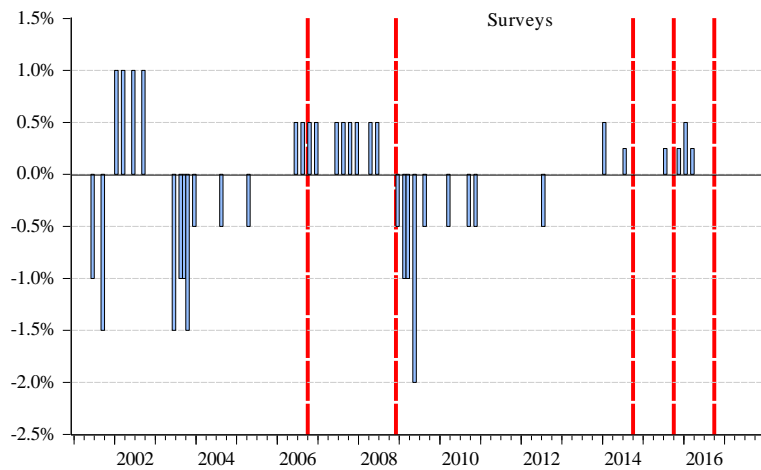
In addition, the data includes both the disaggregated inflation forecasts of the participants as well as a range of socio-economic characteristics about each respondent. As displayed in table 1, we have details about the age, race, income, gender, community size, education (only for 2014, 2015 and 2016), region and language of each respondent. The table presents the average inflation expectations of the sample of respondents across each of these characteristics.

Inflation Expectations By Socio-economic Strata

Socio-Economic Variable		OCT2006	DEC2008	OCT2014	OCT2015	OCT2016
AGE	Under 50 years	5.63 (3.30)	9.35 (4.44)	6.62 (3.41)	6.96 (3.15)	6.17 (3.58)
	Over 50 years	5.50 (3.97)	9.81 (4.27)	7.07 (3.35)	7.60 (3.70)	6.68 (4.05)
RACE	Black & Coloured	5.05 (3.88)	9.14 (4.32)	6.67 (3.59)	7.02 (3.23)	6.12 (3.38)
	Indian & White	5.61 (3.67)	10.00 (4.45)	7.01 (2.95)	7.34 (3.48)	6.63 (4.25)
INCOME	R1 to R4999	5.29 (4.12)	9.35 (4.16)	6.79 (3.55)	7.18 (3.48)	6.62 (4.03)
	R5000 and above	5.27 (3.58)	9.57 (4.54)	6.77 (3.33)	7.11 (3.25)	6.18 (3.59)
GENDER	Male	5.23 (3.73)	9.40 (4.52)	6.68 (3.22)	7.15 (3.53)	6.32 (3.81)
	Female	5.33 (3.88)	9.57 (4.26)	6.88 (3.56)	7.11 (3.09)	6.26 (3.59)
COMMUNITY SIZE	Metro and Other Urban	5.28 (3.81)	9.48 (4.39)	6.78 (3.39)	7.13 (3.32)	6.29 (3.70)
	Rural	ND	ND	ND	ND	ND
EDUCATION	No school	NA	NA	5.50 (4.95)	8.60 (1.34)	7.50 (3.54)
	Some primary to High School	NA	NA	6.81 (3.46)	7.09 (3.30)	6.36 (3.85)
	Some Uni & Uni	NA	NA	6.78 (3.46)	7.27 (3.52)	6.10 (3.29)
REGION	Western Cape	5.98 (3.65)	8.94 (3.51)	7.09 (3.17)	6.62 (3.24)	7.40 (5.61)
	Gauteng	5.39 (4.41)	9.65 (5.24)	6.65 (3.14)	7.31 (3.54)	6.14 (3.12)
	KZN	5.09 (3.68)	9.33 (3.81)	6.78 (3.91)	7.40 (3.21)	5.77 (2.34)
	Rest of country	4.88 (3.02)	9.71 (4.05)	6.72 (3.56)	7.08 (3.08)	5.96 (3.08)
LANGUAGE	English	5.75 (4.29)	9.71 (4.07)	7.18 (3.78)	7.10 (3.10)	6.70 (4.59)
	Afrikaans	5.25 (2.93)	9.70 (4.35)	6.95 (2.86)	7.05 (3.52)	6.32 (3.60)
	Other Languages	5.04 (3.92)	9.22 (4.59)	6.53 (3.48)	7.18 (3.32)	6.09 (3.24)

5. Results

In order to begin identifying the socio-economic factors that are most relevant to modelling the inflation expectations, we begun with OLS regressions for each of the 5 years (results in table 2). A very limited quantity of the variance of the data is explained by these models and few variables were robustly significant over the 5 years analysed. The most robust results are for the variable black, English and Afrikaans. While results suggesting that black people on average have higher inflation expectations may be reasonable, the finding that English and Afrikaans speaking people have higher expectations is in conflict with this and intuitive. Given the heterogeneity of the population we were not surprised by these poor results. Estimates that show the mean responses can be very misleading.

Table 2: OLS results

	OCT 2006	Oct 2008	Oct 2014	Oct 2015	Oct 2016
Dependent Variable: RESPONSES (inflation expecations)					
Method: Least Squares					
Included observations	1972	2018	2188	2155	2224
Variable	Coefficient (p-value)	Coefficient (p-value)	Coefficient (p-value)	Coefficient (p-value)	Coefficient (p-value)
BLACK	**12.89 (0.00)**	**13.06 (0.00)**	**8.13 (0.00)**	**7.36 (0.00)**	**10.01 (0.00)**
INDIAN	**3.35 (0.08)**	-0.19 (0.89)	0.65 (0.59)	-0.43 (0.64)	0.63 (0.58)
WHITE	-0.02 (0.99)	**2.75 (0.01)**	0.71 (0.33)	0.62 (0.29)	**3.51 (0.00)**
R10000PLUS	**-5.88 (0.00)**	-1.66 (0.07)	0.22 (0.81)	-0.48 (0.44)	**-3.74 (0.00)**
R5000_R9999	**-4.73 (0.01)**	-0.86 (0.32)	0.57 (0.52)	0.05 (0.93)	**-2.57 (0.00)**
R2000_R4999	-1.57 (0.36)	0.55 (0.52)	0.95 (0.30)	0.10 (0.87)	**-1.36 (0.08)**
A25_34	-1.01 (0.31)	0.08 (0.92)	**1.14 (0.10)**	**0.35 (0.46)**	0.00 (1.00)
A35_49	-0.40 (0.68)	0.45(0.56)	0.71 (0.29)	0.04 (0.93)	0.40 (0.47)
A50PLUS	0.39 (0.70)	0.21(0.79)	0.44 (0.51)	0.48 (0.33)	0.04 (0.95)
ENGLISH	**13.05 (0.00)**	**12.61(0.00)**	**7.04 (0.00)**	**7.22 (0.00)**	**10.82 (0.00)**
AFRIKAANS	**8.57 (0.00)**	**12.65 (0.00)**	**6.03 (0.00)**	**8.02 (0.00)**	**8.49 (0.00)**
NGUNI	-1.81 (0.11)	**3.13 (0.00)**	**-1.02 (0.09)**	-0.04 (0.94)	-0.63 (0.31)
FEMALE	-0.48 (0.50)	0.35(0.52)	0.20 (0.62)	-0.28 (0.40)	-0.12 (0.77)
WCAPE	0.70 (0.67)	**-3.48 (0.01)**	0.31 (0.69)	-0.34 (0.61)	**2.16 (0.01)**
ECAPE	0.62 (0.72)	**-6.75 (0.00)**	**-1.74 (0.06)**	-0.50 (0.52)	**-2.93 (0.00)**
KZN	**-3.65 (0.02)**	**-2.45 (0.04)**	-0.97 (0.24)	1.12 (0.11)	**-2.47 (0.00)**
FREESTATE	0.92 (0.58)	**-4.40 (0.00)**	0.92 (0.46)	0.73 (0.39)	**-2.90 (0.00)**
GAUTENG	**2.49 (0.06)**	**-2.87 (0.01)**	-0.84 (0.24)	-0.00 (0.99)	-0.66 (0.38)
METRO	0.30 (0.73)	0.72 (0.34)	0.23 (0.66)	0.53 (0.22)	0.41 (0.43)
GROUP_4	-0.38 (0.85)	NA	NA	NA	NA
GROUP_5	-1.28 (0.50)	NA	NA	NA	NA
GROUP_6	0.26 (0.89)	NA	NA	NA	NA
GROUP_7	3.17 (0.13)	NA	NA	NA	NA
GROUP_8	0.39 (0.86)	NA	NA	NA	NA
GROUP_9	0.49 (0.83)	NA	NA	NA	NA
GROUP_10	-0.34 (0.89)	NA	NA	NA	NA
R-squared	0.05	0.03	0.01	0.01	0.07
Adjusted R-squared	0.04	0.02	0.00	0.00	0.06
S.E. of regression	15.34	12.04	9.35	7.60	9.34
Sum squared resid	457750.63	289632.77	189581.25	123377.90	192447.50
Log likelihood	-8169.16	-7874.62	-7985.88	-7418.95	-8115.81
Durbin-Watson stat	1.98	1.79	1.41	1.36	1.35
Mean dependent var	8.62	11.63	8.10	8.00	7.83
S.D. dependent var	15.63	12.17	9.36	7.60	9.65
Akaike info criterion	8.31	7.82	7.32	6.90	7.32
Schwarz criterion	8.39	7.88	7.37	6.95	7.36
Hannan-Quinn criter.	8.34	7.84	7.34	6.92	7.33

Note: coefficients that are significant at the 10% level or stronger are presented in bold print. p-values appear in parentheses. NA = not available

Therefore quantile regressions were used next to consider how these coefficients may vary at different point along the distribution. There are considerable differences in both the size and type of variable that influences response depending on which part of the distribution of responses we focus on. The sampling adopted so far focuses on tau=.1 to .2 and tau=.8 and .9. The former represents the lower part of the response distribution (i.e., lower inflation expectations) while the latter of course refers to the upper end of the inflation expectations response distribution. The results for Oct 2016 are presented in table 3. The results of the other years are available on request, but do not differ greatly.

Table 3: Quantile Regression Results for Oct 2016

Dependent Variable: RESPONSES				
Method: Quantile Regression				
Included observations: 2224				
Huber Sandwich Standard Errors & Covariance				
Sparsity method: Kernel (Epanechnikov) using residuals				
Bandwidth method: Hall-Sheather, bw=0.026507				
Estimation successfully identifies unique optimal solution				
	tau = 0.1	tau=0.2	tau = 0.8	tau=0.9
Variable	Coefficient (p-value)			
BLACK	**3.00 (0.00)**	**4.32**	**9.43**	**13.00 (0.00)**
INDIAN	**1.00 (0.02)**	**1.05**	**1.43**	-2.00 (0.52)
WHITE	**0.50 (0.06)**	**0.50**	**2.43**	**4.00 (0.00)**
R10000PLUS	0.00 (1.00)	**0.45**	**-2.43**	**-4.00 (0.00)**
R5000_R9999	0.00 (1.00)	0.05	**-1.43**	**-3.00 (0.01)**
R2000_R4999	0.00 (1.00)	0.05	-1.00	**-2.00 (0.08)**
A25_34	**-0.50 (0.02)**	-0.18	-0.14	0.00 (1.00)
A35_49	0.00 (1.00)	0.05	0.14	0.00 (1.00)
A50PLUS	**0.50 (0.01)**	0.14	0.00	0.00 (1.00)
ENGLISH	**2.50 (0.00)**	**3.45**	**9.43**	**16.00 (0.00)**
AFRIKAANS	**2.50 (0.00)**	**3.91**	**8.00**	**10.00 (0.00)**
NGUNI	0.00 (1.00)	-0.27	-0.14	**-1.00 (0.09)**
FEMALE	-0.00 (1.00)	0.09	-0.14	-0.00 (1.00)
WCAPE	-0.00 (1.00)	-0.23	**3.00**	**12.00 (0.00)**
ECAPE	-0.50 (0.30)	-0.09	**-0.86**	**-2.00 (0.00)**
KZN	-0.50 (0.13)	**-0.55**	**-1.14**	**-2.00 (0.00)**
FREESTATE	-1.00 (0.01)	**-1.45**	**-1.29**	**-3.00 (0.00)**
GAUTENG	-0.00 (1.00)	**-0.55**	-0.43	-1.00 (0.11)
METRO	0.50 (0.02)	**0.45**	**0.43**	**1.00 (0.01)**
Pseudo R-squared	0.01	0.01	0.03	0.10
Adjusted R-squared	0.00	0.00	0.03	0.09
S.E. of regression	10.76	10.32	9.42	11.54
Quantile dependent var	3.00	4.00	8.00	10.00
Sparsity	10.54	6.99	10.88	23.29
Mean dependent var	7.83	7.83	7.83	7.83
S.D. dependent var	9.65	9.65	9.65	9.65
Objective	1229.70	2150.06	4605.17	4083.10
Restr. objective	1241.20	2168.60	4767.60	4514.60

Note: coefficients that are significant at the 10% level or stronger are presented in bold print. p-values appear in parentheses.

In general, race and income appear to have a significant influence on the responses (i.e., inflation expectations), and perhaps the most consistent result across all surveys is that black people tend to respond with higher inflation expectations, ceteris paribus. The other strong result we find is that language is consistently significant across all surveys (including in the panel estimates). However, these strong, higher responses, ceteris paribus, from the English and Afrikaans people is clearly problematic. We suspect that it is highly correlated with characteristics like income and education and it therefore picking up the variation in these. We have tried a range of interaction terms but this has not yet solved this problem.

Expectations also differ by region although the response change across surveys and so do the regions, though the Western Cape and Gauteng are routinely statistically significant. An interesting side finding is that the response tend to match changes in the SARB's policy rate, that is, the response is higher when the policy rate is rising, and falls when the policy rate is falling.

Age distribution begins to matter beginning with the December 2008 survey and this remains more or less the case throughout the remaining surveys. The panel estimates appear to show that younger (i.e., less than 50 years) tend to have lower responses than the remainder of the population.

When education is added we tend to find that the more educated the lower the response although there are exceptions and this result is perhaps a function of whether the policy is rising, stable or not. And finally, wealth (i.e., the GROUP variable) does not seem to matter much except when we estimate the same regressions in a panel setting

In general there are more socio-economic factors that influence the responses found at the upper end of the distribution than at the lower, and therefore, lower inflation expectations end of the distribution.

Given that our main aim is to identify the characteristics of sub-groups in the sample (and therefore population) we are considering turning now to using rank correlation and clustering. In this case, we would not be modelling inflation expectations, but that is not necessary at this stage.

In addition, we aim to model the Phillips curve using the socio-demographic groups in order to establish which groups are more responsible for the inflationary dynamics that the SARB is in fact targeting.

6. Discussion/Conclusion

We are not yet able to make any firm conclusions. The OLS and quantile regression results have confirmed that we need to consider analysing the household data as sub-groups, so that we are able to characterise these groups. While the regression results have started identifying some characteristics these have not been strong and we are now exploring other techniques to do so.

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