

Inflation in a time of inequality: Assessing the relevance of cost of living measures for the poor

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Abstract

In common with most official consumer price indices (CPI) around the world, the South African index is used both as a macro economic indicator and a cost of living escalator. Is it appropriate to combine these in a nation showing extremely high levels of inequality? South Africa has the world's highest Gini coefficient and about half of its population is considered to be poor. The aggregate CPI reflects the expenditure patterns of the richest 20%. This situation has attracted public criticism that the CPI is not a suitable cost of living indicator as it does not represent the conditions of the majority of citizens.

The paper will unpack the skewed distribution of expenditure and describe the current available data tracking inflation for different groups. Criticisms of these in literature and by interest groups are sketched. Alternative methods of calculating cost of living indices will be explored including group-specific price indices and democratic weighting. Indices will be calculated and compared. Proposals for further study will highlight any improvements to the suite of price indices that may better meet the needs of those concerned with the quality of life of the poor in an unequal society.

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A. Introduction

South Africa has consistently recorded among the highest levels of inequality globally – a Gini co-efficient of 0,68 in 2015 based on income per capita (Stats SA 2017). A recent World Bank report (2018) found that by almost any measure, South Africa is one of the most unequal countries in the world. Furthermore, while the country has made progress in reducing the levels of poverty since democracy in 1994, the high levels of inequality ultimately acts as a break on poverty reduction efforts (Sulla & Zikhali 2018). South Africa's National Development Plan (NDP), the country's chief developmental framework and long-term plan, has identified the reduction of inequality as one of the two priority objectives alongside poverty reduction (NPC 2012).

Given the high levels of poverty, South Africa has an extensive poverty alleviation programme, consisting mainly of free social services (health, education, housing, etc.) and fiscal transfers in the form of social grants (TIPS 2017).

Tracking the cost of living of residents in order to inform wage increments was the original purpose of national consumer price indices (ILO 2004). Today, CPIs are, however, more often designed with the foremost goal of reflecting changes in the general level of prices to inform the setting of monetary policy. Deflation of the national accounts is a further important use of CPIs and thus, the concepts underlying the CPI should be aligned with those of the national accounts.

A common perception in South Africa is that the poor generally experience higher levels of inflation. Recent media headlines such as “Why inflation hits the poor hardest” (Ngema, 2017) and “Inflation is breaking the poor” (van Rensburg, 2016) are examples.

Prior to 2009, the South African CPI defined itself as “a general measure of price change of consumer goods and services bought by *typical households* in SA” (Stats SA 2007, p41). Although no longer in use, it is a concept that still underpins public perceptions of an inflation index. While it is common for an official CPI to show a bias towards the more wealthy of the population due to its total expenditure (plutocratic) weighting structure, its public acceptance and credibility rests on its relevance to the general population. Significant inequality and the high levels of poverty that dramatically shapes South African society puts this to the test.

More specifically, consumer price indices are used to deflate poverty levels and escalate social assistance mechanisms (such as the monetary grants noted earlier). Should the poor experience significantly different increases in the cost of living compared to the official inflation rate, they become poorer in real terms. This has been described as an ‘Inflation tax’ (Koch and Bosch 2009).

This paper goes beyond existing South African studies by using the most recent and detailed expenditure and price data available. It aims to assess the extent to which the inflation experienced by the poor in South Africa is significantly different to that reported by the headline rate. Following a review of local studies on this topic, eight

reference groups with expenditure weights are defined and constructed. These include households at South Africa's three national poverty lines, those receiving social grants, and households earning the minimum wage. Weights for the median expenditure household and democratic index are also computed. Inflation rates for each of these groups are calculated and then compared.

B. Literature review

The traditional literature on cost of living indices (COLI) is neatly summarised in the CPI manual (ILO 2004). COLIs aim to track the change in the minimum cost required to maintain a certain level of utility or welfare. An inflation measure, and most national CPIs, track the change in price of a fixed basket of goods and services. The latter approach is more practical for producing timely price indices, but it ignores substitution.

The recently published World Bank (2017) report on measurement of poverty (known as the Atkinson report) raises a number of issues related to the use of price indices in poverty measurement. Some of these concern specific methods used in CPIs such as the exclusion of own production and the ability to track shifts between subsistence and consumption expenditure -, a common survival strategy of the poor. This problem is compounded when household expenditure surveys take place infrequently.

Atkinson points out that the weighting system typically biases the CPI towards the expenditure of the rich (plutocratic) which reduces its usefulness in estimating real changes in poverty. Common CPI practices may lead to under-reporting price changes experienced by the poor. These include reporting an urban CPI (i.e. excluding rural areas) and the selection of outlets and product varieties that are more commonly used by the non-poor.

South African studies (see Kahn, 1985; Oosthuizen, 2007; and Koch, 2009) largely concur with the conclusion of much of the international literature. That there is no substantial difference in the inflation rates of different groups but that the most vulnerable groups have higher variation in inflation (Oosthuizen 2007, Koch 2009).

There have been only three specific attempts to create group specific indices for South Africa since 1985.

Kahn (1985) conducted work for the Carnegie Commission into Poverty. Using CPI data for 1975 – 1982 and household expenditure data from 1975, he constructed 30 group specific indices based on income bands, race, location and type of employment. He concluded that during this seven year period the poor did experience higher inflation than the average, but that for the first two years of the period, the inverse was true.

Morne Oosthuizen of University of Cape Town has conducted two studies constructing group specific indices (2007 and 2013). In the first, he considers inflation data from 1997 to 2006 and household expenditure data from the Income and Expenditure Survey (IES) of 2000. He creates group specific indices for expenditure deciles, as

well as a democratically weighted index. Detailed attention is paid to the specific products contributing higher or lower inflation for the different groups. Over this period it is not possible to identify any single group that experiences higher or lower inflation than the others, or the average CPI. However, there are periods where there is a clear pattern (poor having higher inflation for example), and periods where the opposite is true. The plutocratic gap (difference between plutocratically and democratically weighted indices) is consequently sometimes positive and sometimes negative. Importantly, he observes that the poor are subject to higher volatility in price changes and that they have less resources to deal with those changes.

In his 2013 study, Oosthuizen takes the topic further by introducing data from Stats SA's Labour Force Survey (LFS). By matching households found in the LFS with those surveyed in the 2000 IES he is able to create weights for nine specific groups of households. These are based on labour market characteristics, receipt of income from grants and presence of children in the household. All the groups share a characteristic of having proportionally higher food expenditure compared to headline CPI weightings. He uses the same price data as his 2007 study, and adds a further two years to cover an 11-year period.

The results reveal that all of his vulnerable household groups show similar inflation patterns, the main difference being the divergence of peaks and troughs. Using a standard deviation measure, Oosthuizen confirmed that the poor have higher variation in their inflation rates and this is extreme at specific points in time. In particular, poorer households have higher inflation than average during periods of relatively high (above 10%) generalised inflation and lower during periods of lower (below 8%) generalised inflation. The differences observed in inflation rates between the different groups is smaller than their collective difference from the headline inflation figure.

A second line of analysis undertaken by Oosthuizen is to measure the variation in inflation of individual households. He finds significant variations over time and that typically 30% of households fall within one percentage point of the average annual inflation rate in any particular month. It also emerges that poorer households tend to fall outside of this one percentage point margin more frequently than average or more affluent households.

C. Methodology

This study creates alternative weighting structures based on selected reference groups of the population and uses these to generate price indices. The main advantages of the method used here compared to the approach taken in previous local studies flow from the availability of detailed data. The weights are constructed using the most detailed expenditure data and the indices are calculated using the approximately 8 000 elementary indices which comprise the monthly CPI dataset.

1. Weighting method

The methods used to construct the weights for the official CPI are well described in publically available documents (Stats SA, 2016). A key feature of the CPI weights is that although they are based on expenditure data reported through the Living Conditions Survey (LCS), adjustments are made to certain categories. These adjustments are effected to the expenditure values of each household allowing a direct linkage between the LCS and CPI.

In order to create reference groups that retain comparability to the published CPI indices, a two stage process of creating the weights sets was followed. Households meeting the criteria for inclusion in a specific reference group were identified from the LCS dataset. The reference groups include households at the food, lower- and upper-bound poverty lines; households who receive a social grant and those where a social grant is their main source of income; minimum wage households; median expenditure households; and a democratically weighted index. The unique numbers of these households were then matched to the CPI weights dataset, which allows the extraction and aggregation of their adjusted expenditure values.

Only expenditure data from 2014/15 as applied to the 2016 CPI weights were used to weight the data. The created indices cover a 10-year period from December 2007 to December 2017. The official CPI used three sets of weights during this period (2008, 2012 and 2016). The use of one set of weights for this research (namely the 2016 weights) is for practical reasons, but is a limitation of the study.

As opposed to the official inflation rate (all urban areas), households from the whole country were eligible for selection to the reference groups. The total country headline figure is therefore used as a benchmark for assessing the performance of the new analytical series. To ensure a like-to-like comparison, the total country index is weighted the same way as the new reference groups – only applying the 2016 weights.

2. Calculation of indices

All indices calculated for this paper use the same set of elementary indices. These are the stored elementary indices used for calculating the CPI. An elementary index is based on the unweighted geometric average of price changes for a particular product range in a specific geographic area (for example brown bread in the City of Johannesburg). There are approximately 410 products in the CPI basket covering 21 regions. Indices for rural areas are based on food prices in the rural area and other prices in the nearest urban area. Indices for products which do not appear in all periods are imputed using higher level indices.

The advantage of using the elementary indices is that they are unweighted and represent the pure price changes experienced by residents of a particular area. These indices were not available to other studies and therefore, are not biased by lower level weightings.

The reference group indices are constructed as a chained Paasche index, using arithmetic aggregation within the COICOP groups to achieve a national headline aggregate.

3. Significance tests

To test whether certain types of household's inflation experiences are different from the headline inflation figure, the means and variances of these measures are analysed. A test of equal medians is included since inflation is generally positively skewed and has excess kurtosis, i.e. not normally distributed.

The year-on-year changes in each reference group of households is compared to headline inflation of the total country from December 2008 to December 2017. The mean, median and standard deviation of each group are calculated and tested for statistical difference from headline inflation. The Welch F-test is used, allowing for unequal variances, to test the equality of means, a Kruskal-Wallis test for equality of medians, and the Levene test for equal variances.

D. Profiles of reference groups

Eight reference groups were created to represent various poor strata of South African society. These can be split into four categories. The first category deals with poverty and contains three reference groups which are based on South Africa's national poverty lines. The second category links to the country's welfare system and contains two reference groups based on grant receiving households. The third category is based on the country's proposed national minimum wage of R3 500 per month. The fourth category contains two sets of indices derived from central tendency measures, namely median expenditure and a democratically weighted index.

1. Poverty reference groups

The first three reference groups link directly to Stats SA's money-metric poverty measures and South Africa's three official national poverty lines, namely the food poverty line (FPL), the lower-bound poverty line (LBPL), and the upper-bound poverty line (UBPL). These lines capture different degrees of poverty and allow the country to measure and monitor poverty at different levels.

The FPL is the Rand value below which individuals are unable to purchase or consume enough food to supply them with the minimum per-capita-per-day energy requirement for adequate health. The LBPL and UBPL are derived using the FPL as a base, but also include a non-food component. Individuals at the LBPL do not have enough resources to purchase or consume both adequate food and non-food items. Meanwhile, individuals at the UBPL can purchase both adequate levels of food and non-food items (Stats SA 2017)

Table 1 below shows the Rand value for each of the poverty lines for 2007, 2015 and 2017. The values for 2015 are the ones that were applied to generate the FPL, LBPL and UBPL reference groups.

Table 1. Inflation-adjusted national poverty lines (per person per month in Rands)

Year	Food Poverty Line (FPL)	Lower-Bound Poverty Line (LBPL)	Upper-Bound Poverty Line (UBPL)
2007	237	396	613
2015	441	647	992
2017	531	758	1 138

Source: Stats SA 2017

Approximately 2.3 million households (or 14% of all households in South Africa) were living below the FPL in 2015, accounting for 2.9% of total household expenditure. The majority of these households were headed by females (57.8%) and mainly (60.7%) live in rural areas.

The LBPL reference group consisted of about 4.2 million households, roughly a quarter of all households in the country (25.1%). Their total expenditure represented 6.5% of total household expenditure in 2015.

The UBPL reference group represents two-fifths of all households in South Africa and accounted for 12.3% of total household expenditure. The UBPL group is the second largest reference group used in this research. As the poverty threshold moves up, the group becomes increasingly urban. Unlike the FPL and LBPL groups, the majority (51.1%) of households found in this group live in urban areas. Looking at the entire South African population, 29.2% of all urban households were UBPL poor compared

with approximately two-thirds (65,6%) of all rural households. (See Annexure A for a more detailed description of the reference groups)

2. Social grant reference groups

Social protection is a necessity in a country with high levels of poverty and unemployment. South Africa's social assistance system has played an integral part in the country's poverty reduction strategy to improve the lives of the poor and reduce their cost of living. The South African social grant system is made up of six grants targeting specific needs: the old aged, disability, war veterans, child support, foster care, and care dependency. In 2016, there were over 17 million grant beneficiaries in the country, up from three million beneficiaries in 2000. The child support grant makes up the largest proportion of all grants dispersed growing from around one million recipients in 2001 to 12 million by 2016.

Two of the reference groups created for this paper benefit from social grants. The first includes all households where at least one household member received at least one of the six social grants. This reference group was the largest subset created using the LCS 2014/2015 dataset and contained approximately 7,8 million households, or 46,7% of all households in South Africa. This group accounted for 27,8% of total household expenditure in 2015.

The second reference group identified all households where the household head indicated that social grants were their main source of income. This subset represented roughly a quarter of all households (23,7%), accounting for approximately 11,9% of total household expenditure. All households found in the second group are already a subset of the first reference group by virtue of the fact that they are receiving social grants.

An initial question prompting this research is the appropriateness of using the headline CPI to escalate the value of social grants. Table 2 below illustrates that using this rate has slightly short-changed grant recipients over a 10 year period. The results below reflect on whether an alternative index would show a different result.

Table 2. Inflation-adjusted values of selected social grants (Rands)

Grant Type	Actual Grant Values in April 2006	2006 Values Inflated to April 2015 Prices	Actual Grant Values in April 2015
Old Age Grant	820	1 439	1 410
Disability Grant	820	1 439	1 410
Child Support Grant	190	334	330

Source: South African Social Security Agency (SASSA) and authors' calculations

3. Minimum wage households

In November 2017, South Africa's government started to approve legislation to set the country's minimum wage to R20 per hour (about R3 500 per month). This policy is aimed at tackling the high levels of wage inequality in South Africa.

To be selected for the minimum wage reference group, households were required to earn between R3 000 and R4 000 a month. Approximately 11,3% of all households in South Africa live within this income range accounting for roughly 4,6% of total household expenditure in 2015.

4. Alternative average measures

Households that reported an annual expenditure of +/- 20% from the median expenditure value comprise the seventh reference group. Approximately 2,7 million households live within this band of expenditure or roughly 16,1% of all households in the country accounting for 6,5% of total household expenditure.

Finally, expenditure weights calculated using the 'democratic' method were computed. This method gives the proportions of each household an equal weight in the total aggregation. Firstly, the expenditure shares for each household are calculated.

$$W_{ih} = \frac{e_{ih}}{\sum_i^n e_{ih}} \text{ Where } e_i \text{ is the expenditure on } i\text{-th item for specific household } h.$$

Then the average expenditure share of item I for all households (H) within a region is computed.

$$W_i = \frac{\sum_h^H w_{ih}}{H}$$

This step is repeated to obtain national proportions.

Table 3 shows the proportion of households each reference group represents relative to the total number of households in the country, as well as the proportion of total household expenditure each group accounts for based on the results of the LCS 2014/2015.

Table 3. Coverage of reference groups

Description of Group	Proportion of total households (%)	Proportion of total household expenditure (%)
Food poverty line (FPL)	14,0	2,9
Lower-bound poverty line (LBPL)	25,1	6,5
Upper-bound poverty line (UBPL)	40,0	12,3
Receives social grant	46,7	27,8
Social grant (main source of income)	23,7	11,9
Minimum wage households	11,3	4,6
Median expenditure households	16,1	6,5
Democratically weighted	100,0	100,0

E. Results

1. Expenditure proportions

It is notable that the expenditure shares for the eight reference groups show a high degree of similarity. This is easiest explained by the high degree of overlap of membership of these groups. For example, all households from the FPL group are contained in the UBPL group.

Table 4 shows the 2 digit COICOP expenditure shares for the different reference groups. Food expenditure represents the largest category across all eight groups. This is in contrast to the total country CPI index where housing and utilities makes up the largest share. The FPL group had the highest share at 34,3% and those households receiving at least one grant being the lowest at 28,2%. These are all higher than the total country proportion of 19,2%.

Table 4. Expenditure proportions for reference groups and total country

COICOP	Food pov line	Low bound Pov line	Up bound pov line	Min 1 soc grant	Main income soc grant	Min wage	Median exp	Democratic	Total country
Food and non-alcoholic beverages	34.33	34.09	33.41	28.19	31.19	33.37	33.06	32.14	19.15
Alcoholic beverages and tobacco	2.56	3.07	3.76	4.02	3.71	6.38	6.17	4.74	5.88
Clothing and footwear	5.22	5.42	5.58	5.14	4.82	6.20	6.13	5.82	4.04
Housing and utilities	8.11	8.07	8.17	9.11	9.21	8.87	8.83	11.87	22.55
Household equipment and maintenance	3.29	3.27	3.19	2.90	3.03	3.01	3.03	3.07	4.33
Health	0.87	1.07	1.08	1.41	1.38	0.95	0.89	1.15	1.26
Transport	18.83	18.10	16.75	16.75	16.33	12.89	13.06	10.27	14.72
Communication	4.42	4.34	4.59	4.45	4.08	5.41	5.42	5.98	2.62
Recreation and culture	2.37	2.45	3.01	4.00	3.41	3.72	3.62	4.01	4.86
Education	0.41	0.61	0.86	2.22	1.67	0.79	0.98	1.74	2.34
Restaurants and hotels	4.41	4.80	4.98	4.06	4.48	5.93	6.00	5.41	3.41
Miscellaneous	15.17	14.69	14.63	17.74	16.67	12.48	12.81	13.80	14.84

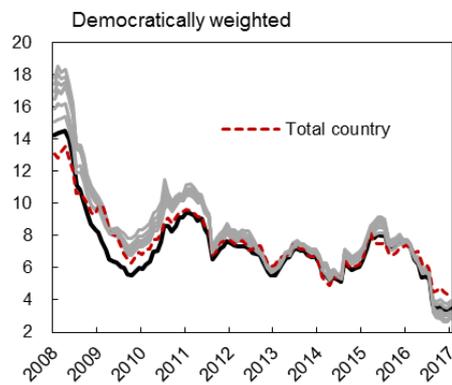
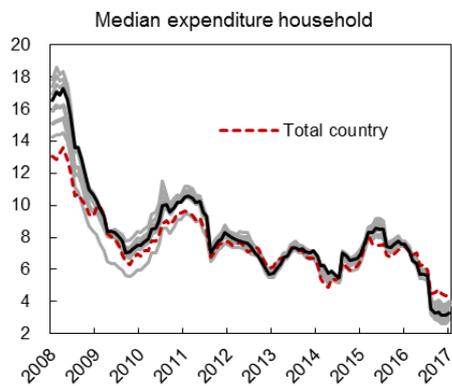
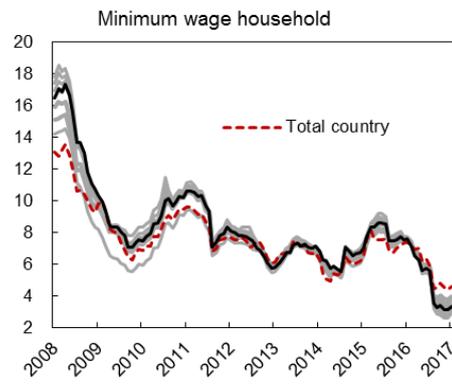
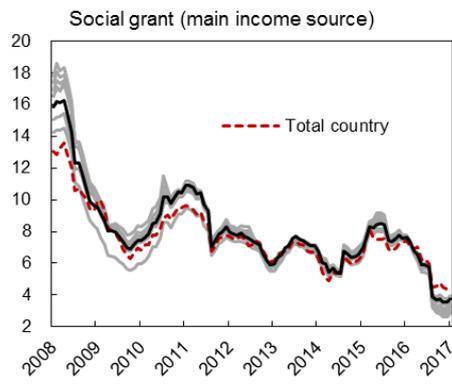
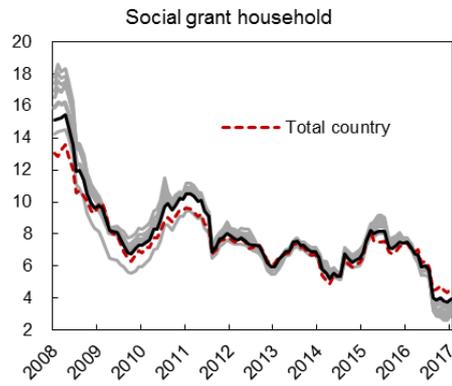
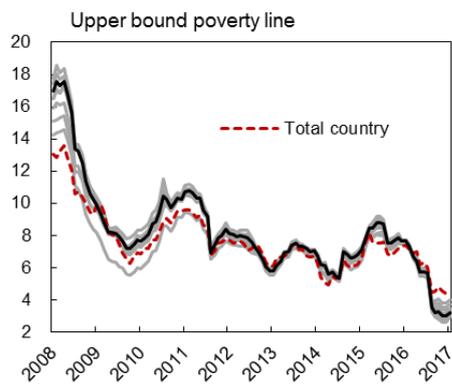
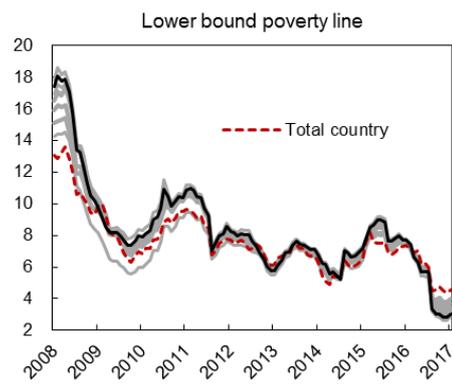
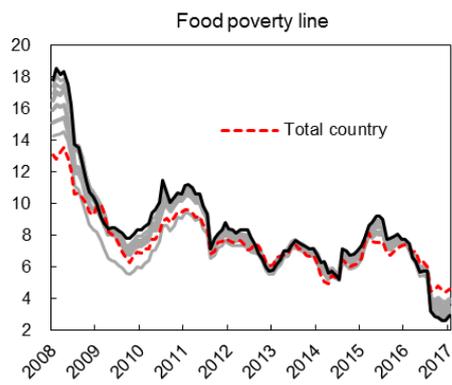
Transport represents the next highest category (also higher than housing and utilities), ranging from 18,8% (food poverty line households) to 10,3% (democratic weighted index). The total country weight for transport lies within this range at 14,7%. Miscellaneous goods and services also comprise a significant proportion of the poor households' budgets (15,5% to 17,7%). Funeral-related costs are the main contributor to this expenditure category. Housing and utilities represents the largest weight of the total country CPI at 22,6%; however, this is much higher than the reference group weights which range between 8% to 12%.

2. Inflation rates

a. Overall rates of inflation

Figure 1 shows the annual inflation rates for the eight reference groups. It is evident that the general inflationary movements are similar over the period under review. This is explainable by the similarity in weights, and of course that the same elementary price indices are used. Some dispersal takes place in periods of very high and very low inflation. Most notably during 2009, from June 2010 to June 2012, February to June 2016, and finally from July to December 2017. In most of the high inflation periods, the FPL and LBPL reference groups experience the highest inflation. These two groups also have the lowest inflation in the 2017 period of low inflation.

Figure 1 Annual inflation rates for all reference groups (excl Total country)



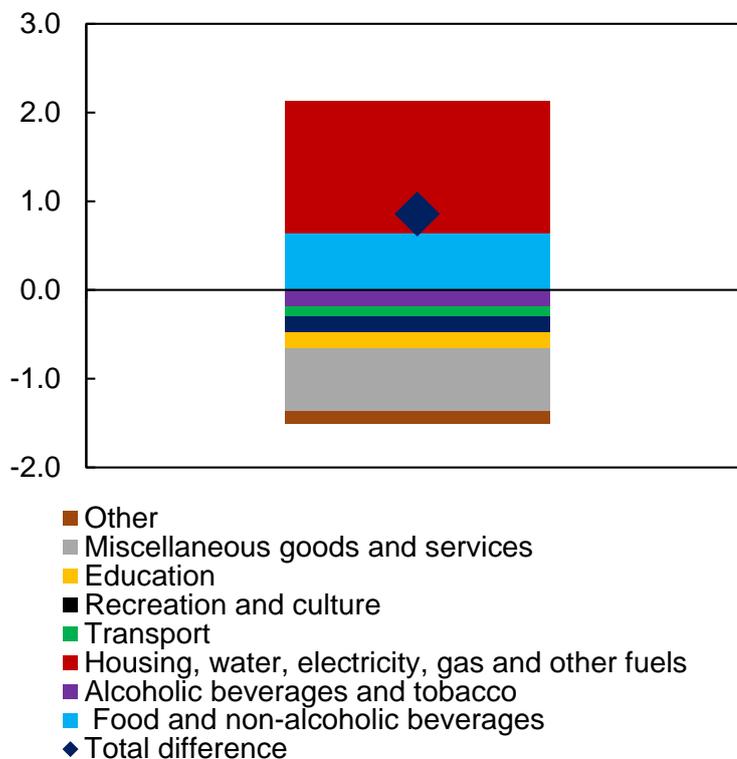
Mean inflation rates were calculated for all of the reference groups (see Table 5). On average, all of the reference groups' inflation rates are higher than total country headline inflation. The highest mean is experienced by households at the food poverty line with inflation at 8,5%; 0,9 percentage points above the total country outcome. The lowest outcome among the reference groups is within social grant receiving households with an inflation outcome of 8%; 0,4 percentage points above the total country average. There are only two household groups that experience statistically significant higher mean inflation than the country average at a 5% level of significance: those at the food poverty line and those at the lower-bound poverty line.

Table 5. Mean and median inflation for all reference groups

Reference group	Mean	Median
Food poverty line	8.49	8.09
Lower-bound poverty line	8.32	7.78
Upper-bound poverty line	8.25	7.69
Social grant households	7.97	7.48
Social grant (MSOI)	8.11	7.58
Minimum wage households	8.23	7.61
Median expenditure households	8.21	7.59
Democratic CPI	7.30	7.05
Headline CPI (total country)	7.63	7.32

Figure 2 shows the difference between total country inflation and food poverty line inflation-weighted by CPI category. Households at the food poverty line experience higher inflation in only two categories: food & non-alcoholic beverages and housing & utilities. In all other categories these individuals experience lower inflation outcomes. The contribution of food and housing and utilities, however, is large contributing 0,6 and 1,5 percentage points, respectively.

Figure 2. The weighted difference inflation experience between households at the food poverty line and total country



Inflation outcomes (in all reference groups) are not normally distributed, with inflation outcomes skewed to the right (skewness is larger than one for all inflation) and having excess kurtosis (fat tails). These empirical distributions do not have the same mean and median as a consequence. From Table 5, it is clear that the median inflation outcome is lower than the mean with the greatest difference between the two being 0.6 percentage points (the median expenditure and minimum wage households). Therefore, we may not be interested in the average inflation experience of households, but rather their median. The median outcomes are similar to the mean outcomes with one exception. As in the case of means, the statistically significantly different households are those at the food poverty line and the lower-bound poverty line.

However, the median inflation outcomes are also different for the upper-bound poverty line, compared with total country inflation.

Inflation volatility also matters in terms of a household's experience of inflation because households whose inflation rate is volatile are likely to face higher financial stress. The consequences on the poor are particularly devastating as their ability to feed themselves is directly affected. Unfortunately in the case of volatility, the majority of the reference groups experience higher inflation volatility and it is statistically significant. The only two groups that do not experience higher volatility than total

country inflation are households that receive social grants and that have social grants as their main source of income.

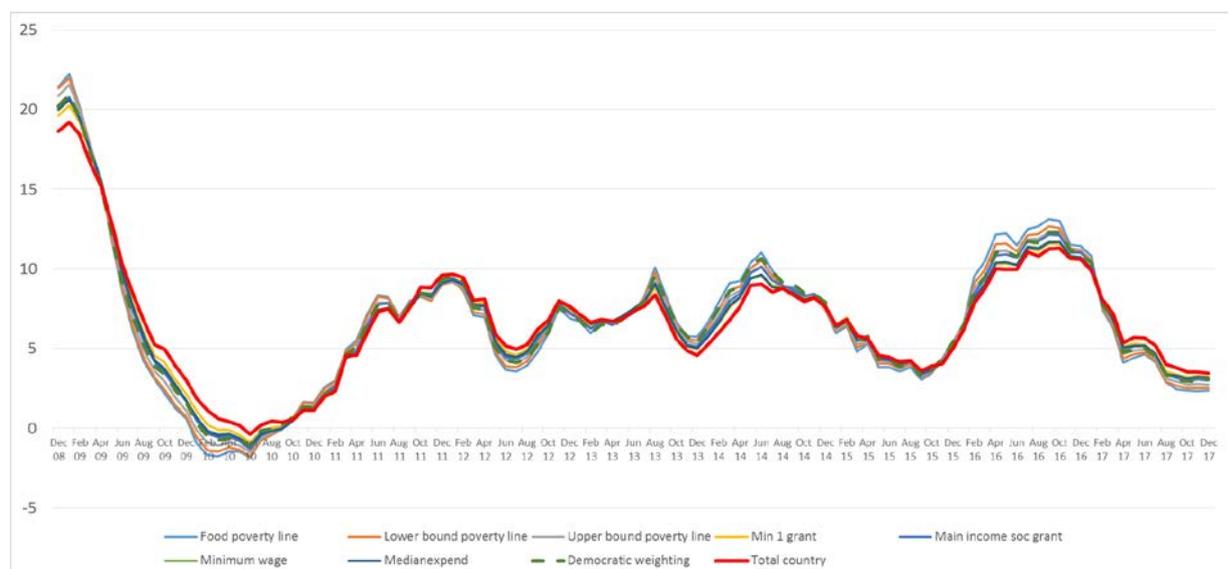
Since the most important differences between households in each sub-category and total country wide outcomes is a function of food & non-alcoholic beverages and housing & utilities, the next section looks at households experience within two these categories.

b. Differences in category inflation

We construct each inflation outcome from the product level and hence a group’s experience of food inflation may be different depending on what type of food they consume and how much of it. Similarly, their experience of housing and energy are different depending on the type of dwelling they stay in and the energy mix they use for cooking, lighting and heating.

Food inflation has averaged 6,7% in South Africa for the decade between 2007 and 2017. It was not very different on average for households at the food poverty line (6,6%), median expenditure households (6,6%), those that receive social grants (6,6%), and in fact all groups studied here. Food inflation was also lower on average than overall inflation experiences, namely 6.7% compared with 7,6%. Food inflation outcomes are also marginally different when comparing the mean and median outcomes, despite a positive skew.

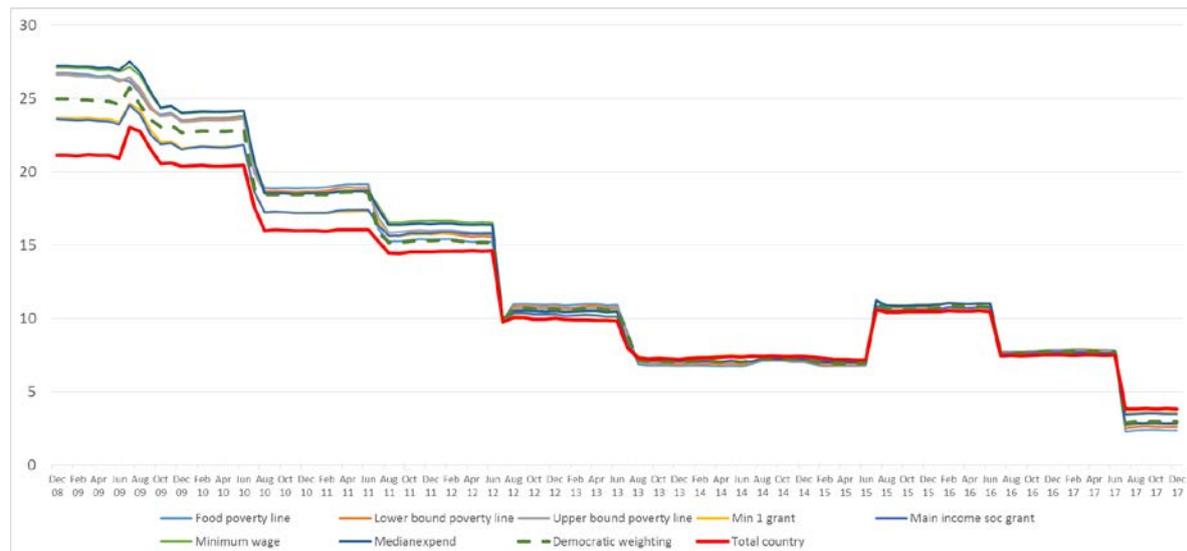
Figure 3. Food and non-alcoholic beverages inflation for all reference groups



Annexure B shows the mean, median and standard deviation differences between the reference groups compared with total country food inflation. No group has a statistically significant different means, medians or volatility compared with total country food inflation. This means that the difference observed in Figure 3 is a function of the amount of expenditure used to buy food.

The biggest contributor to the difference between inflation experiences of those at the different poverty lines, social grant recipients and minimum wage workers is housing and utilities. This category has averaged 11,9% in the country as a whole but higher, between 0,6 and 1,3 percentage points at the subcategory level. These differences are however, not statistically different from each other. Median outcomes are lower, at 10,4% for the total country. Median differences are also not statistically significant.

Figure 4. Housing and utilities inflation for all reference groups



Despite the same mean and median outcomes, volatility in housing and energy is high at 5,3%. The reference groups also experience significantly more volatility outcomes compared with the total country outcome. The only group that does not experience statistically significant differences from the total country are social grant receivers.

F. Conclusion

This paper set out to understand the extent to which headline inflation represents aggregate price changes experienced by the poor. The first observation can be drawn from the descriptions of the different reference groups. Rural residents feature strongly in the reference groups. The total country index is used as a benchmark here since the coverage of the official headline inflation rate is limited to urban areas. By definition, roughly 61% of households in the food poverty line and 42% of those receiving social grants are not included in the official inflation rate.

Nonetheless, most of the reference groups did not experience statistically significant higher inflation levels than that for the headline total country. This finding confirms local and international studies that found little difference between headline and poor-group specific inflation rates over long periods of time. Additionally, no difference was found in the component (food and housing) inflation rates between the different groups.

The exception to this are households living below the food and lower-bound poverty lines. These groups contain the poorest of households. A quarter of all households spend less than the lower bound poverty line, making up only 6,5% of total household expenditure. The significant difference in inflation between these two groups and headline inflation points to an underestimation of the deflator used for under-deflation of poverty levels and a possible miscalculation of escalation factors in the monetary value of benefits and services targeted at their protection.

Also in line with international studies, all of the reference groups experienced significantly higher volatility in their inflation rates than seen in the headline measure. This phenomenon speaks directly to the survival strategies employed by the poor in dealing with inflation peaks. Without household assets to cushion spikes in inflation, the poor may be forced to increase subsistence activities or significantly reduce certain expenditures.

From a policy perspective, this study cannot recommend that social assistance should be escalated with any group specific index. None of these show any significant difference from the total country headline measure. Furthermore, the volatility of the group indices means that there are times when the group specific indices will fall below the headline measure. Raising social grants by less than headline inflation in these periods may be perceived as unfair.

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Annexure A

Table A1: Description of reference groups

Name of Reference Group	Description	Settlement Type (%)		Sex of Household Head (%)		Average Annual Household Expenditure (Rands)
		Urban	Rural	Male	Female	
Food Poverty Line (FPL)	Households living below the FPL of R441 per person per month	39.3	60.7	42.2	57.8	21 606
Lower-bound Poverty Line (LBPL)	Households living below the LBPL of R647 per person per month	44.8	55.2	44.9	55.1	26 839
Upper-bound Poverty Line (UBPL)	Households living below the UBPL of R992 per person per month	51.1	48.9	48.4	51.6	31 669
Receives Social Grant	Households that reported receiving one or more of the six social grants	58.4	41.6	43.8	56.2	61 474
Social Grant (main source of income)	Households where the household head reported that social grants were their primary source of income	51.1	48.9	30.1	69.9	51 833
Minimum Wage	Households that earn +/- R500 of the minimum wage of R3 500 per month (i.e. R3000 and R4000 per month)	68.0	32.0	55.9	44.1	41 719

Median Expenditure	Households within a +/- 20% range of the medium expenditure of R42 522 per annum	67.7	32.3	55.0	45.0	41 799
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Annexure B

Table B1: Comparing overall inflation experiences

	Mean	Test for equality of means	Median	Test for equality of medians	Standard deviation	Test for equality of variances
Headline CPI (total country)	7.63		7.32		1.90	
Food poverty line	8.49	6.1***	8.09	7.4***	3.08	8.0***
Lower bound Poverty line	8.32	4.2**	7.78	5.0**	2.95	6.8***
Median Expenditure Household	8.21	3.2*	7.59	2.9*	2.82	6.3***
Minimum wage Household	8.23	3.4*	7.61	3.0*	2.84	6.8***
Social Grant (MSOI)	8.11	2.5	7.58	2.7	2.55	3.8*
Social Grant Household	7.97	1.3	7.48	1.3	2.37	2.4
Upper bound Poverty line	8.25	3.6*	7.69	3.9**	2.87	6.2**
Democratic CPI	7.30	1.4	7.05	3.2*	2.20	0.3

*** 1% level of significance, ** 5% level of significance, * 10% level of significance

Table B2: Comparing food inflation experiences

	Mean	Test for equality of means	Median	Test for equality of medians	Standard deviation	Test for equality of variances
Headline CPI (total country)	6.67		6.72		3.78	
Food poverty line	6.56	0.04	6.51	0.08	4.50	2.18
Lower bound Poverty line	6.56	0.04	6.51	0.08	4.50	2.18
Median Expenditure Household	6.58	0.03	6.59	0.06	4.12	0.45
Minimum wage Household	6.58	0.03	6.59	0.06	4.11	0.42
Social Grant (MSOI)	6.63	0.01	6.49	0.02	4.20	0.84
Social Grant Household	6.63	0.01	6.53	0.02	4.02	0.22
Upper bound Poverty line	6.58	0.03	6.61	0.07	4.36	1.34
Democratic CPI	N.A.		N.A.		N.A.	

*** 1% level of significance, ** 5% level of significance, * 10% level of significance

Table B3: Comparing housing and energy inflation experiences

	Mean	Test for equality of means	Median	Test for equality of medians	Standard deviation	Test for equality of variances
Headline CPI (total country)	11.94		10.40		5.34	
Food poverty line	13.07	1.79	10.97	0.69	6.99	9.9***
Lower bound Poverty line	13.09	1.87	10.82	0.73	6.94	10.4***
Median Expenditure Household	13.27	2.41	10.86	1.04	7.17	14.4***
Minimum wage Household	13.28	2.45	10.88	1.16	7.13	14.4***
Social Grant (MSOI)	12.56	0.64	10.53	0.92	6.02	3.2*
Social Grant Household	12.57	0.66	10.58	1.23	6.05	3.3*
Upper bound Poverty line	13.12	1.97	10.83	0.87	6.90	10.5***
Democratic CPI	N.A.		N.A.		N.A.	

*** 1% level of significance, ** 5% level of significance, * 10% level of significance