INFLATION INEQUALITY IN SOUTH AFRICA

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ABSTRACT

The inflation crisis of 2008 drew greater attention to the varying experiences of inflation in South Africa and, in particular, to the fact that different groups within society may have significantly differing inflation experiences. The groups may be defined according to income level, but may also be categorised according to demographic, labour market and other characteristics.

The first aim of this research is to investigate differences in the inflation rates experienced by different types of households. Instead of using income/expenditure to group households, various labour market and household structure characteristics are used. The groups analysed include grant recipient households, unskilled worker households, unionised worker households and households with children. Significant differences between the group-specific and all urban inflation rates may suggest the need for using group-specific price indices in applications where the purchasing power of these households is to be preserved.

Secondly, the paper investigates the extent to which the all urban inflation rate is representative of individual households, using household-specific inflation rates. The paper analyses the distribution of household-specific inflation rates relative to the all urban inflation rate, as well as the relationship between the level of the overall inflation rate and the dispersion of household-level inflation rates.

JEL Classification Codes: D12, D31, D63, E31, I30

Keywords: price level, inflation, group-specific inflation, inequality, poverty, South Africa

CONTENTS

1. INTRODUCTION

Poverty and inequality are two important characteristics of the socioeconomic context in post-apartheid South Africa. Rooted in widespread unemployment, particularly amongst those with lower educational attainment, and apartheid-imposed inequalities in access to quality education, South Africa's level of income inequality is amongst the highest in the world, while millions continue to live in poverty almost 20 years after the country's democratic transition. Estimates of inequality vary, but recent estimates of the Gini coefficient have tended to range between 0.6 and 0.8. Of the 64 countries for which the World Bank (2012) has at least one estimate between 2008 and 2010, South Africa has a Gini coefficient of 0.631, higher than any other country and 0.062 points higher than second-placed Honduras' coefficient of 0.570.

Poverty in South Africa today remains correlated with the bases of discrimination that characterised the country under apartheid. Recent poverty estimates by Argent et al. (2009, 2) based on the first wave of the National Income Dynamics Survey of 2008 find that the African poverty rate is 62.8 percent, compared to 31.7 percent for Coloureds, 16.7 percent for Asians and just 2.5 percent for Whites.[1,2] This racial hierarchy reflects the hierarchy of discrimination and preference practised under the apartheid system and corresponds with the pattern of labour market disadvantage. This poverty ranking is consistent with those in other studies since 1994 (see, for example, Woolard and Leibbrandt (2001), Hoogeveen and Özler (2006), Armstrong et al. (2008), Leibbrandt et al. (2010)). Further, poverty rates are higher for female-headed as opposed to male-headed households, for rural households as opposed to urban households, and for households with less educated heads as opposed to those with better educated heads.

The centrality of the labour market in the determination of incomes and, therefore, poverty status in South Africa is undisputed. For example, Leibbrandt et al. (2010, 35) find that income from the labour market accounts for 85.0 percent of income inequality (as measured by the Gini coefficient) in 2008. Despite the removal of apartheid-era restrictions on individuals' engagement within the labour market, deep-seated inequality in labour market outcomes persist. This is the result of, amongst other factors, unequal educational endowments (both quantity and quality), differing levels of work experience and of networks, varying local labour market dynamics and a mismatch in the spatial distribution of population and economic activity (particularly for Africans), and language barriers across demographic groups in South Africa.

While many factors combine to determine the income level and poverty status of a household, including the presence of a resident income-earner, receipt of remittances and access to income from social grants, the prices faced by households are central in translating nominal income into specific utility levels. Consequently, price changes over time will impact, positively or negatively, on welfare and are therefore critical to our understanding of households' welfare. Consumer price index (CPI) data is central to at least three sets of decisions that impact directly on South African consumers, and particularly those at the lower end of the income distribution. First, the inflation rate, both historical and expected, is a key variable influencing wage increases in South Africa's extensive collective bargaining system, estimated to have covered 20.3 percent of the employed in 2004 (own calculations, Godfrey et al. (2006, 22-23). Second, the

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[1] African, Coloured, Asian and White are the four main race groups in South Africa and, although the classifications have no legal status, they are commonly used in socioeconomic analyses and for purposes of redress.
[2] Poverty rates are calculated on the basis of household per capita expenditure, using a poverty line of R502 per month. This value is equivalent to the R322 lower bound line proposed by Hoogeveen and Özler (2006), referred to below, updated for inflation over the period.

CPI is used in determining periodic adjustments to minimum wages in sectoral determinations that covered an estimated 29.2 percent of employment in 2004 (own calculations, Godfrey et al. (2006, 22-23). Third, the CPI is an important input in determining the extent of the adjustments made to the nominal values of South Africa's various social grants, disbursed to 15.7 million grant beneficiaries out of South Africa's estimated 50 million people (SASSA, 2012*a*).

However, CPIs are vulnerable to plutocratic bias, which arises due to the fact that aggregate expenditure weights are calculated as a weighted average of individual households' expenditure weights, the weight being proportional to that household's share of total expenditure. As a result, CPIs tend to reflect the inflation experiences of wealthier households more closely than those of poor households. The greater the extent of inequality within a society, the further up the income distribution the 'representative' household will be located. The literature presents two options for addressing this bias. The first is to calculate expenditure weights in such a way as to ensure more equal representation of all households, with democratic weights calculated as an arithmetic mean across all households of their unique expenditure weights. The second option is to calculate price indices for subpopulations, thereby reducing within-group inequality and heterogeneity in consumption patterns. The first option was the main focus of an earlier paper (Oosthuizen, 2007), which investigated the differences between plutocratically- and democratically-weighted price indices, as well as the differences in inflation rates across ten expenditure deciles.

This paper, though, focuses on the potential differences in the inflation rates experienced across different households. This is done in two ways. First, inflation rates are analysed for various types of households and compared to the overall inflation rate. Thus, it is possible to determine the extent to which the overall inflation rate is representative of the inflation rates experienced by these different groups of households. Secondly, household-specific inflation rates are calculated and compared with the overall inflation rate. This makes it possible to gauge the ability of the overall inflation rate to proxy for the inflation rates experienced by individual households. In so doing, this paper tries to answer the question as to whether particular groups require differential treatment – from government or employers – in order to ensure the preservation of their purchasing power over time.

2. LITERATURE REVIEW

That inflation rates differ across households is not a new observation. Differing patterns of consumption as well as differences in the prices paid combine to result in inflation rates that may differ significantly across household groups. The vast majority of analyses, however, focus on the differences that arise due to differing consumption patterns across households, mainly due to the scarcity of data linking prices, expenditures and households.

Official CPIs are typically presented as measuring the changes in prices affecting the average household over time. For example, in South Africa, the CPI is described as "showing how the average price level of those goods and services... bought by a typical consumer or household changes over time" (Statistics South Africa, 2002*a*, 1). However, the 'average household' does not exist and the CPI is, at best, a proxy for the experiences of individual households.

CPIs as constructed by statistical agencies around the world are vulnerable to plutocratic bias. Weights are constructed to reflect the composition of aggregate

spending: the weight for an elementary aggregate being total spending across households on that item as a proportion of the total spending across households on all items. Mathematically, this can be represented as:

$$w_i^P = \frac{\sum_{h=1}^{H} e_i^h}{\sum_{i=1}^{n} \sum_{h=1}^{H} e_i^h}$$

(1)

Where w_i is the weight of elementary aggregate i for $i = 1,..., n$ items, e_i^h represents the expenditure on elementary aggregate i by household h for $h = 1, ... , \mathcal{H}$ .These weights – referred to as plutocratic weights – therefore tend to more closely reflect the expenditure patterns of households with high expenditures. As Prais (1959, 126) notes, the plutocratic weight w_i^P attached to a specific elementary aggregate i can be expressed as an unequally weighted average of the household-level expenditure shares, with the weights being each household's total expenditure across all items. The inflation rates derived from indices calculated using plutocratic weights most closely resemble the inflation rates experienced by households located towards the upper end of the expenditure distribution.

Exactly where in the distribution this 'representative household' is located is related to the extent of expenditure inequality. Thus, for example, the representative household in Spain in the 1990s has been found to have been located in the 61st percentile of the income distribution (Izquierdo et al., 2003, 149), in the 71st percentile in the United Kingdom in the 1970s (Muellbauer (1974), as referred to in Izquierdo et al. (2003, 149)), and in the 75th percentile in the United States in 1990 (Deaton, 1998, 43). In four Latin American countries – Brazil, Colombia, Mexico and Peru – the representative household is found to be located between the 80th and 90th percentiles using data from different periods between the late 1980s to the early 2000s (Goni et al., 2006, 7). In South Africa, with its extreme inequality, the representative household was located in the 95th percentile in 2000 (Oosthuizen, 2007, 20).

There are essentially two approaches presented in the literature for addressing this bias. The first is to calculate expenditure weights in such a way as to ensure that each household's expenditure pattern is equally weighted, irrespective of its specific expenditure level. These weights are termed democratic weights (Prais, 1959, 127), and are derived as the mean of the individual household-level weights for a given elementary aggregate. In symbols, the democratic weight w^D for elementary aggregate i is calculated as:

$$w_i^D = \frac{1}{H} \sum_{h=1}^{H} \left(\frac{e_i^h}{\sum_i^n e_i^h} \right)$$

(2)

utilising the same notation as above. Using both plutocratic and democratic weights to calculate inflation rates allows for the estimation of the plutocratic gap, defined as the former inflation rate less the latter. The plutocratic gap may be non-zero where three conditions are met: there is inequality in the distribution of household expenditures; there are differences in consumption patterns correlated with total expenditure; and there are differences in price movements for some items that are consumed differently (Ley, 2005, 638). Where the plutocratic inflation rate is higher than the democratic inflation rate, the plutocratic gap will be positive, indicating that items consumed relatively more by rich households are experiencing greater price increases.

The second approach aims to reduce expenditure inequality and heterogeneity in expenditure patterns by calculating price indices for sub-populations (group-specific price indices). In so doing, the ability of the CPI to reflect the inflation experiences of households is improved.

Group price indices have received considerable attention internationally over the past 40 years, although studies have tended to focus on developed countries. Various criteria may be used to group households. Most commonly, households are grouped according to income or expenditure, thereby separating better and worse off households whose expenditure patterns may often differ markedly. Importantly, grouping households according to this criterion explicitly reduces intra-group inequality, thereby reducing the extent of plutocratic bias. Examples of studies focussing on poor households and the difference in inflation rates between poor and non-poor households include Hollister and Palmer (1972), Hagemann (1982), Garner et al. (1996) and McGranahan and Paulson (2006) for the United States, Taktek (1998) for Canada, and Murphy and Garvey (2004) for Ireland.

Alternatively, groups may be defined based on demographic or labour market characteristics of household members or household structure. Examples of particular characteristics or structures include:

• Age of household head or reference person: households with elderly reference persons (Amble and Stewart, 1994; Moulton and Stewart, 1999; Stewart, 2008); by age category of the household head (Michael, 1979);

• Race of household head or reference person: households with (non-)white reference persons (Hobijn and Lagakos, 2005);

• Education of household head or reference person: households whose reference persons have various levels of educational attainment (i.e. completed college, some college, high school graduate, less than high school) (McGranahan and Paulson, 2006);

• Household structure: households with(out) children (Idson and Miller, 1999; Crawford and Smith, 2002); lone parents, couples with(out) children and single adults (Crawford and Smith, 2002); detailed household structure combined with income level (Fritzer and Glatzer, 2009); married with(out) dependents (Creedy and Van De Ven, 1997); single, couples with(out) children, single parents (Cepparulo et al., 2010);

• Behavioural characteristics: households that save (i.e. that either received income from savings or who contributed to a pension), and homeowners (McGranahan and Paulson, 2006); renters and mortgagors (Crawford and Smith, 2002); and

• Other characteristics: households that are recipients of food stamps (McGranahan and Paulson, 2006); region of residence (Michael, 1979).

There is little evidence to support the notion that a specific type of household may consistently experience above (or below) average rates of inflation over long periods. This is despite the fact that numerous studies in the area have covered periods in excess of ten years. Garner et al. (1996, 40) investigate possible differences in price indices for poor and non-poor households in the United States

between 1984 and 1994 and find that the price indices of poor households do not differ much from those of the general urban population. Similarly, Murphy and Garvey (2004, 3-4) use four price indices – for urban poor households, rural poor households, all poor households and all households – and find little difference in these indices between 1989 and 1996, although there is some divergence between 1996 and 2001. Having constructed CPIs for 31 different groups of households, McGranahan and Paulson (2006, 34) conclude that the inflation experiences of vulnerable groups had not been very different to that of the general urban population in the United States between 1983 and 2005. Using Austrian data between 2000 and 2008, Fritzer and Glatzer (2009, 102) construct price indices for 18 groups of households based on household composition and income level and find that poorer households on average experienced a 0.1 percent per annum higher rate of inflation than the official inflation rate.

Very little work on these issues has been undertaken in Africa. McKay and Sowa (2004) investigate inflation rates across households in different locations and by income groups using the Ghana Living Standards Survey conducted in 1998/99. The analysis is conducted at a very high level of aggregation and does not find significant differences in the rates of inflation faced by poor households compared to the population as a whole. This is due to the "remarkable consistency in patterns of purchases across household groups" at this level of aggregation (McKay and Sowa, 2004, 16). However, in further analysis of some of the major food categories, the authors find important differences in the types of food purchased by households of different income levels and, with more detailed data, they might have found differently.

The first published study focussing on South Africa is that of Kahn (1985), who calculates consumer price indices for various groups defined by location, income and race. Over the seven year period between 1975 and 1982, Kahn calculated that the poorest three groups in both Cape Town and Johannesburg experienced average inflation rates that were above the national average. From a base of 100 in 1975, the CPI for Blacks with incomes of between R250 and R499 per annum in Cape Town rose to 246.0 by 1982, while that of their Johannesburg counterparts increased to 242.7. In contrast, the overall CPI increased to 233.7 over the same period, while that of the highest income Whites, those earning in excess of R15 000 per annum, rose to only 229.4. However, Kahn's figures also reveal that for the first two years of the period, these same three poorest groups had lower CPIs than high-income Whites in both cities. While Kahn (1985, 11) notes that the differing expenditure patterns of the various groups gave rise to the differing CPIs, he concludes that "in general the lower income groups are faced with a higher CPI than the higher income groups".

Using the same expenditure data as used here but a two-year shorter time period, Oosthuizen (2007) analyses the inflation rates of households grouped into ten expenditure deciles for the period between January 1997 and December 2006. He finds no evidence to suggest that either rich or poor households experience consistently higher or lower rates of inflation than the average (Oosthuizen, 2007, 57). Calculating separate indices using plutocratic and democratic weights, the author finds that the plutocratic gap (the difference between the two inflation rates) cycles between positive and negative values throughout the period, indicating no long-term consistency in which group experienced higher rates of inflation. The study also investigates the key sources of inflation for poor households (including items such as paraffin, brown and wholewheat bread and mealie meal), as well as identifying items that were responsible for divergence or convergence in the inflation rates of poor households relative to the mean.

One of the important implications of research into group-specific price indices relates to our understanding of the evolution of poverty and inequality over time. Indeed, this is true of many applications where the CPI is used to deflate nominal values. Numerous papers have used their calculated group-specific price indices to deflate nominal income/expenditure figures to ascertain the impact on trends in poverty and inequality and there is evidence to suggest that using group- specific rather than overall price indices may impact materially on trends. Crawford and Smith (2002, 32), using UK data, conclude that "the effects of differential price adjustment on the incomes of a population of heterogeneous households can sometimes give strikingly different results from the standard approach which uses an inflation adjustment that is common to all households". They find that inequality measures may move in opposite directions and, where this is not the case, not allowing for differential inflation resulted in an overstatement/understatement of inequality by as much as six percentage points. Using data for nine inflation episodes across four Latin American countries, Goni et al. (2006, 12) find that "changes in nominal inequality provide an upward-biased measure of the underlying changes in real inequality", due to the fact that inflation was found to be "anti-rich" in all but one of the inflation episodes. In contrast, Moulton and Stewart (1999, 149), conclude that using the CPI for all urban consumers rather than an index for the poor has no "significant impact on benefit eligibility or levels", based on US data between 1982 and 1997.

3.   DATA AND METHODOLOGY

3.1 Data

The construction of consumer price indices requires two types of data, namely data on household expenditures and detailed price data. For this study, expenditure data is obtained from the Income and Expenditure Survey of 2000 and price data is obtained directly from Statistics South Africa.

Statistics South Africa collects nationally representative data on household expenditures (and incomes) on a regular basis. In 1995, 2000 and 2005/06, Statistics South Africa conducted Income and Expenditure Surveys (IES). While the IESs will continue at five-yearly intervals, the new Living Conditions Survey (LCS), first conducted in 2008/09, will provide similarly detailed expenditure data in between the IESs. Since 1995, the IESs have historically been the basis for the weights of the CPI published by Statistics South Africa, although other data is also often incorporated into the weight calculations.

The IES 2000 is used here to obtain detailed expenditure data. This survey is located more or less in the middle of the time period under investigation and, importantly, it is possible to link this survey to the September 2000 Labour Force Survey (LFS). This link is critical from the perspective of this study as it allows for the incorporation of labour market data, in particular, enabling the construction of the various household groups that are defined in terms of household members' labour market characteristics. The IES 2000 covers more than 26 000 households and 104 000 individuals and data is weighted according to the 2001 Census weights.

The IES 2000 is, however, somewhat controversial. Since the publication of the dataset, numerous inconsistencies and problems with the dataset have been uncovered. For example, aggregate income estimates from the IES 2000 do not align with national accounts estimates (Vermaak, 2005, 2). Simkins (2004, 3) notes that "a considerable number of observations in the 2000 IES are seriously inaccurate and/or incomplete", while Whites are under-represented in the survey (Hoogeveen and Özler,

2004, 41, as cited by Van der Berg et al. (2006, 11)). Nevertheless, the dataset was used to reweight the official CPI and the revised weights were applied in 2002. There is, though, one data problem in the IES 2000 that is not easily resolved, namely the very poor recording of interest on mortgage bonds. Of the 26 263 households in the cleaned dataset, only 2 006 reported non-zero values for the previous month's bond instalment. Of these, the instalments of only 816 households equalled the sum of the reported capital and interest components, while this was not true of 1 190 households. Further, 180 households reported total capital and interest components in excess of the instalment. As a result, interest on mortgage bonds was excluded from the analysis.

In many settings, this may represent a significant flaw in the analysis. However, the exclusion of interest on mortgage bonds aligns the price indices calculated here with the official CPIX index, defined as the CPI excluding interest on mortgage bonds. This index was the inflation measure targeted by the South African Reserve Bank in terms of its monetary policy responsibility between 2002 and 2009 and was widely used in wage negotiations, the updating of nominal minimum wages and other settings as the key measure of inflation.[3] Nevertheless, though, this omission does affect an important component of expenditure, particularly amongst better-off households, and the price indices presented here are, therefore, incomplete reflections of the cost of living.

The merge between the IES and LFS is not perfect. Of the combined unweighted total of 26 685 households, 113 (0.4 percent) are found only in the IES and 422 (1.6 percent) are found only in the LFS. In order to preserve as much of the data as possible, the latter group of households were omitted from the combined dataset, with the impact confined to the construction of household groups based on the LFS data only. Once rural households are omitted – Statistics South Africa does not collect rural price data and published CPIs are therefore urban CPIs – an unweighted total of 14 925 households remain, of which 59 do not have corresponding LFS data.

The price data used derives from Statistics South Africa's monthly Survey of Retail Prices. Prices are collected for all "consumer goods and services in the basket sold by... retail trade and service outlets to consumers in the 14 metropolitan and 39 other urban areas" across South Africa (Statistics South Africa, 2002*b*, 1). The raw price data collected in this survey is extremely detailed and there are often multiple price series for a single expenditure category within the IES. Within expenditure categories, these price series are combined into single price index with the aid of external data, which is not necessarily publicly available, that informs the relative weighting of the price series within the combined index. For example, while there is a single weight in the CPI for white bread, in the raw price data there are mean prices for different types of loaves (e.g. 700 gram loaves and 800 gram loaves). Statistics South Africa then uses information on the sales of these different types of loaves to weight the mean prices to construct a price index. These price indices take into account the extensive information that Statistics South Africa has at its disposal on the various types, quantities and qualities purchased by consumers and are therefore used in the construction of the price indices below.

The price data covers the period from January 1997 to December 2008, a period covering 144 months in total. Most of the individual price indices have data for the

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[3] The decision to omit interest paid on mortgage bonds from the inflation target stems from the fact that the 'price' used for this elementary aggregate was the interest rate. Thus, the interest rate would therefore be both the instrument used by monetary policy authorities, as well as forming part of the target of monetary policy.

entire period, although missing data is interpolated from the rest of the price data. With 144 months of price data, it is possible to construct a monthly series of year-on-year inflation rates covering 132 months, from January 1998 to December 2008.

There are various instances where the expenditure data obtained from the IES 2000 does not correspond exactly with Statistics South Africa's price indices. In fact, the price data does not correspond exactly with the expenditure categories as published by Statistics South Africa (2002*b*). Consequently, both expenditure and price data may need to be realigned to provide proper matches between the two datasets. The most common adjustment entails the consolidation of expenditure items in the IES to match a given price item. For example, within the Fruit and Nuts expenditure category in the IES, separate expenditure categories exist for Apples and Other deciduous fruit. However, in the price data, there exists only a single price series for deciduous fruit and so expenditures in the IES for these two items are combined to form a single item, Deciduous fruit. This adjustment is made for many of the 'other' expenditure categories.

Sometimes, price data may not exist for a particular expenditure item at all. In such instances, it is assumed that the price movements for the expenditure category are an appropriate proxy for the price movements for that individual item. This is in line with practice at Statistics South Africa. For example, within the Transport category, Statistics South Africa did not collect price data on taxi transport. To create a price series for taxi transport, a price index is created using other items within the public transport subcategory (e.g. bus, train and air transport). Wherever such price indices are created, they are created using an expenditure (sub-)category that is as narrowly defined as possible. This method is also used to fill price series that are missing data, based on the assumption that the price movements within the relevant (sub-)category are a decent proxy for price movements in periods where the data is missing.

The final type of adjustment involves situations where two or more price series refer to a single expenditure item in the IES. In such cases, the price relatives are averaged across the price series and a new consolidated price series is generated and applied to the expenditure weight in the price index calculation. An example of where this occurs is in the case of brown and wholewheat bread, which is a single item in the IES, but for which there are separate price indices for brown bread and wholewheat bread. The price indices for brown bread and wholewheat bread are converted to price relatives – the price in a given period being divided by the price in the previous period – and the individual series are then averaged in each period. This averaged series is converted back into a price index and is applied to the brown and wholewheat bread weight.

The available price data imposes an important limitation on the analysis below. While the weights calculated on the basis of the IES data may be said to be representative of specific types of households or, indeed, for individual households, this is not true of the price data. As already noted, the price data derives from a survey that is limited to metropolitan and urban areas. However, it is not possible to differentiate the price data in terms of the specific types of retail outlets from which households may choose to purchase these items, or in terms of the mix of brands or quantities purchased. For example, poorer households may purchase smaller quantities more often from informal traders, while better off households may purchase bulk quantities from major formal sector retail outlets. Insofar as there is systematic heterogeneity in the price behaviour according to type of outlet, qualities or quantities related to household characteristics, this may impact on the

estimates of inflation presented below.

3.2   Methodology

For group price indices, the weights constructed here are conventional plutocratic expenditure weights. Weights are calculated as:

$$w_i^X = \frac{\sum_{h=1}^{J} e_i^h}{\sum_{i=1}^{n} \sum_{h=1}^{J} e_i^h} \tag{3}$$

where w_i is the weight of the elementary aggregate i for i = 1, ... , n items, X designates the group of households and e_i^h represents the expenditure on elementary aggregate i by household h for h = 1, ... , $\mathcal{J}$ where $\mathcal{J} < \mathcal{H}$, the total number of households.

In the case of household-level price indices, the above equation is simplified to calculate household-specific expenditure weights derived directly from each household's expenditure pattern. Thus, the weights for household h are calculated as:

$$w_i = \frac{e_i^h}{\sum_{i=1}^{n} e_i^h} \tag{4}$$

using the same notation as above.

Official South African consumer price indices are fixed-weight Laspeyres-type indices. Expenditure weights are calculated at a given point in time and are used until such time as further use would compromise the weights' ability to accurately reflect prevailing expenditure patterns, at which time new expenditure weights are typically constructed. Reweighting of the CPI typically occurs once every five years in South Africa, although Statistics South Africa does plan to increase the frequency of reweighting. The price indices are not true Laspeyres indices due to the fact that the weights and prices refer to different time periods (the weights are annual data, while the prices are monthly data).

The Laspeyres price index is calculated as:

$$L_{t,0} = \sum_{i=1}^{n} w_{i,0} \frac{p_{i,t}}{p_{i,0}} \tag{5}$$

expressed as a percentage, where $w_{i,0}$ is the average expenditure share for item i for the sample of households in period 0 and $p_{i,t}$ and $p_{i,0}$ are the prices of item i in periods t and 0 respectively. The use of unchanging weights from the base year is the target of one of the main criticisms of Laspeyres(-type) indices. This is because these weights do not allow for substitution by consumers in response to relative price shifts over time. Consequently, such indices represent and upper bound for the true change in the cost of living.

Numerous other types of indices that may be used instead of the Laspeyres index exist. One alternative is the Paasche index, which uses variable weights and is calculated as:

$$P_{t,0} = \frac{1}{\sum_{i=1}^{n} w_{i,t} \left(\frac{p_{i,0}}{p_{i,t}} \right)} \tag{6}$$

using the same notation as above, and where $w_{i,t}$ represents the average expenditure share for item i for the sample of households in period t. In other words, the CPI for 2000 uses weights calculated from 2000's expenditure data, while that of 2001 uses weights from 2001's expenditure data. This index is, therefore, relatively data intensive in that it requires frequent expenditure surveys. Unfortunately, the only two expenditure surveys that were conducted during the period covered by the price data were those of 2000, which is used as the base in this study, and 2005/06, which is located right near the end of the period. More importantly, the 2005/06 IES employed significantly different methodology to that of earlier IESs, most notably in the implementation of a weekly diary. While it is not clear whether the diary caused it, the IES 2005/06 saw a significant underreporting of expenditures relating to food and personal care in particular, when compared to both earlier surveys and available macro data. Indeed, the problem was significant enough to necessitate, amongst other adjustments, a 30 percent upward adjustment of food expenditures during the compilation of the new weights for the Consumer Price Index (CPI) (Statistics South Africa, 2008, 6). These adjustments are reported on at a high level and detailed information on the exact adjustments made is not publicly available.

Fisher's ideal index, the geometric mean of the constant-weight Laspeyres index and the current weight Paasche index, is theoretically a "very close approximation to a true cost-of-living index" (Garner et al., 1996, 37). While the calculation of Paasche and Fisher indices would have been the ideal for this study, suitable data does not exist to allow the calculation of weights for more than two of the years covered, ignoring the difficulties associated with the 2005/06 IES data. As a result, Laspeyres-type indices are calculated below.

Household-level price indices are calculated directly from the expenditure patterns of individual households. For each household, expenditure weights relating expenditure on an elementary aggregate to total expenditure are constructed. These weights are then applied to the same price indices used in the construction of the group price indices. The result is more than 26 000 household-level price indices covering a period of 144 months.

4.   INFLATION INEQUALITY ACROSS HOUSEHOLD TYPES

4.1 Grouping Households

Numerous variables that may impact on expenditure patterns can be used to differentiate households. As noted, these include income or expenditure level, location, demographic characteristics of household members and household heads (or reference persons), household structure, behavioural characteristics of households and their members, or socioeconomic status. Statistics South Africa routinely publishes price indices for various groups of households. These include CPIs for pensioners; for the country's nine provinces; for primary, secondary and all urban areas; for rural areas (although this is calculated using rural weights and urban prices); and for five quintiles based on household expenditure. To avoid duplicating existing published CPIs, this research will focus on defining households with reference to characteristics of their involvement in the labour market, their receipt of state welfare grants, and the presence of children in the household. Since the analysis builds on previous work by Oosthuizen (2007), which uses expenditure deciles to categories households, income or expenditure are ignored as possible grouping characteristics here.

Using the characteristics of households' labour market involvement as a way of grouping households may be a slightly unusual approach, but is not without precedent.

McGranahan and Paulson (2006) calculate price indices for the 'working poor'. Amongst official statistical agencies, Italy's ISTAT publishes a CPI for blue and white-collar worker households based on the expenditure patterns of households where the reference person is an employee (ISTAT, 2012), while the US Bureau for Labor Statistics publishes a CPI for Urban Wage Earners and Clerical Workers, referred to as CPI-W (Bureau for Labor Statistics, 2012). In South Africa, however, there is no officially published CPI nor any published research that specifically calculates inflation for such groups.

The household groups defined according to labour market characteristics of household members have been chosen to reflect some of the vulnerable groups within the South African labour market, as well as groups that are relevant to wage bargaining processes. Unskilled workers, defined as those employed in elementary occupations or as domestic workers, number 3.9 million and account for 28.9 percent of total employment in 2012Q1 (own calculations, Quarterly Labour Force Survey 2012Q1). This represents an increase of roughly half a million workers (and 1.5 percentage points of total employment) compared with the September 2000 LFS. While workers in elementary occupations may often be part of collective bargaining units, domestic workers' minimum wages and conditions of employment are regulated by sectoral determinations issued annually by the Minister of Labour. A second vulnerable group analysed here is informal sector workers. The South African informal sector is quite small relative to other African and middle income countries. The informal sector accounts for just 16.5 percent of non-agricultural employment, inclusive of domestic work, in 2012Q1 (17.9 percent in 2000). This compare to 2009 estimates of 24.3 percent in Brazil and roughly one-third in Argentina, Costa Rica, Mexico, Uruguay and Venezuela, while Mauritius is the only African country for which there is data that has a smaller informal sector (9.3 percent of non-agricultural employment) (International Labour Organisation, 2011).

The third vulnerable group is households with unemployed members. A skills-biased growth path, rising capital intensity and systematic neglect of the education of non-Whites have combined to create a serious structural unemployment problem. It is estimated in 2012Q1 that 4.5 million South Africans are unemployed according to the narrow definition of unemployment, meaning that the individual is ready and able to work and is taking active steps to find work, yielding an unemployment rate of 25.2 percent in 2012Q1. A further 2.3 million individuals are non-searching unemployed, with the unemployment rate according to this broader definition estimated at 33.8 percent (Development Policy Research Unit, 2012a, 3). Consequently, less than two-thirds of adults in the prime working ages between 30 and 54 years are actually employed, with the proportion significantly lower for other cohorts within the working age population (Development Policy Research Unit, 2012b, 1). Although not directly comparable due to methodological changes, the narrow unemployment rate in the September 2000 LFS is estimated to have been 25.4 percent, with the expanded unemployment rate at 34.3 percent.

Other household groups defined according to members' labour market characteristics include formal sector worker households as a group and separately as public and private sector worker households, and unionised worker households. From a policy perspective, the latter household group is potentially one of the more interesting groups. Unions have historically played a significant role within the South African economy. The most recent data from the Quarterly Labour Force Survey estimates union membership at almost 3.2 million (32.5 percent of formal employment) and 2.6 million (32.9 percent) in urban areas. Unionised worker households are not listed

amongst the vulnerable groups above due to the bargaining power that they enjoy within the South African labour market. The view, though, that unions are bargaining on behalf of poor workers may motivate wage demands above the prevailing inflation rate and calculating a separate CPI for this group would be useful in evaluating this position.

Grant-recipient households are another important group within South African society. South Africa's welfare system is extensive and relatively well developed. By the end of 2011, 15.4 million South Africans were in receipt of a social grant. Three grant types account for more than 95 percent of all grants paid by the state, namely the child support grant (CSG, 10.8 million beneficiaries), the old age pension (OAP, 2.7 million beneficiaries) and the disability grant (1.2 million beneficiaries) (SASSA, 2012b, 7). Although they are of relatively low value, the extent of the system means that social grants impact meaningfully on poverty. Armstrong and Burger (2009, 19) find social grants to be "very effective in alleviating poverty", using the 2005/06 IES and the Foster-Greer-Thorbecke (FGT) poverty measures (i.e. poverty headcount ratio, poverty gap and squared poverty gap). At a poverty line of R2 532 in 2000 prices, social grants are found to reduce the poverty rate from 45.5 percent to 31.6 percent, a decline of 13.8 percentage points (Armstrong and Burger, 2009, 12). Thus, while grant recipient households are by definition relatively poor, they are unlikely to be concentrated at the very bottom of the urban income distribution, particularly in terms of total household income as opposed to per capita household income. This latter phenomenon underlies the finding by Leibbrandt et al. (2012, 27–28) that grants had almost no effect on overall inequality, based on their decomposition of the Gini coefficient by income source. However, comparisons of pre- and post-grant Gini coefficients by Bhorat et al. (2009, 47) show that state grants reduced the Gini coefficient for per capita income by 0.05 points to 0.72 points in 2005.

Figure 1: Indices of Real Values of Selected State Grants, 1997–2008
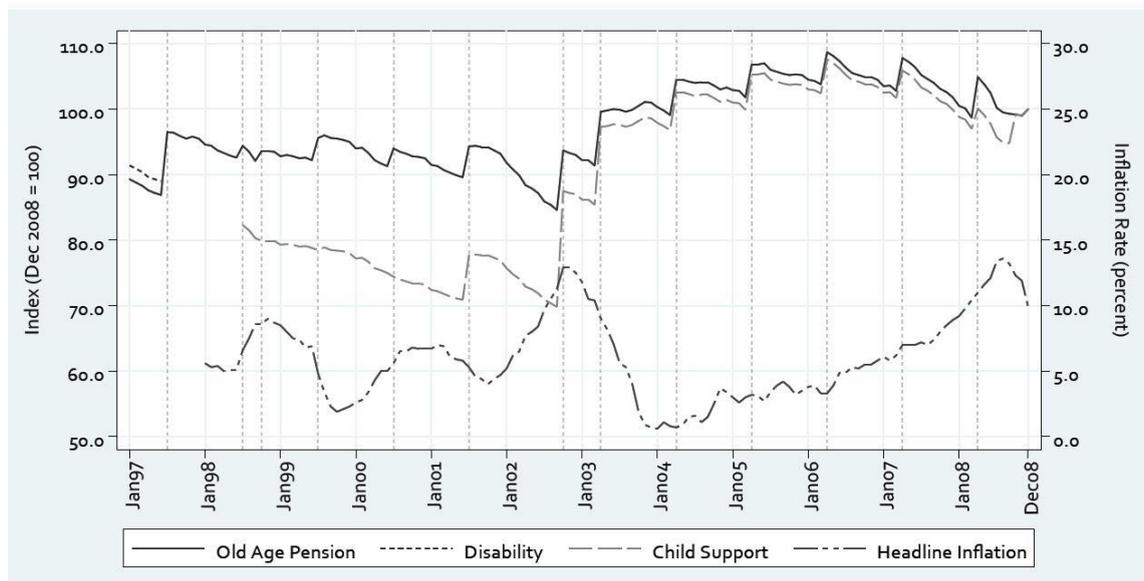
Source: Own calculations, IES 2000 and LFS 2000:2.
Notes: Vertical dotted lines represent months in which nominal grant values were adjusted, apart from mid-year adjustments to the CSG in October of 2008 and 2011. The value of the disability grant is equal to that of the old age pension from July 1997 onwards. Nominal grant values were deflated using the All Items CPI for Metropolitan and Other Urban Areas (headline CPI).

The nominal values of state grants are generally updated annually as part of the National Budget, published by National Treasury in February. These adjustments

are made taking into account the financial sustainability of the overall welfare system, as well as the erosion of the real value of grants over time. However, adjustments have not always managed to keep pace with the headline inflation rate. Real grant values declined gradually during the late 1990s and early 2000s, and from 2006 to 2008 (see Figure 1). Indeed, without the significant upward adjustments of nominal grant values that occurred from October 2002 onwards, real grant values in 2008 might have been substantially lower than those in 1997.

The final household group is that of households with children. Given that these households are home to children, they are exposed to particular expenditure items that other households will be considerably less exposed to in the same way that pensioner households have particular expenditure patterns. Knowing the evolution of purchasing power amongst these households is central to understanding changes in these households' welfare.

One of the major challenges in terms of defining the various groups of households is to define them in such a way as to reduce intra-group inequality. Lower inequality (in terms of per capita household income) is associated with less heterogeneity in households' expenditure patterns. This then implies that, where the group is not a high-income group, its aggregate expenditure patterns are more likely to differ from the expenditure patterns for the urban population as a whole. While household groups are easily defined within the survey data, there tends to be significant inequality within groups, as qualifying households are spread widely across the income distribution. In an effort to reduce this inequality, each group defined below has been trimmed to retain only those households located from the 5th to the 95th percentile of the group-specific per capita income distribution. By eliminating outliers, this slightly reduces the number of households within each group, but significantly reduces intra-group inequality.

The three types of household groupings proposed for this analysis – labour market characteristics, receipt of grants, presence of children – are chosen primarily for the potential usefulness of the resulting price indices in wage and grant value adjustments, and the analysis of poverty amongst these types of households. All three have precedent in the literature, as indicated earlier. However, given that many of these characteristics are individual-level characteristics, there are various ways in which the household groups may be defined. For example, an unskilled worker household may be defined as a household where at least one employed household member is an unskilled worker, or where all employed household members are unskilled workers, or where the household head is an unskilled worker, or where household income is dominated by unskilled worker wages. In most cases, there is no objective reason to favour one definition over another. Where appropriate, however, the definitions used to define household groups here require that regular household income be dominated by a particular type of income.

The following definitions are, therefore, used to define household groups:

- **Grant recipient households**: At least 90 percent of regular household income[4] is in the form of social grants;

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[4] Regular household income is defined in the IES 2000 as including: salaries and wages; net profit from business or professional practice/activities or farming conducted on a full-time or regular part-time basis; net income from the letting of fixed property; interest received and/or accrued; dividends on shares other than building society shares; regular receipts from pension, social welfare and grants provided and other annuity funds; alimony, maintenance and similar allowances received from divorced spouse or family members living elsewhere; and regular allowances received from family members living elsewhere.

- **Unskilled worker households**: At least 90 percent of regular household income is in the form of wages from employment in unskilled occupations, namely elementary occupations or domestic work;

- **Unionised worker households**: At least 90 percent of regular household income is in the form of wages from employment of union members;

- **Public sector worker households**: At least 90 percent of regular household income is in the form of wages from employment in the (formal) public sector;

- **Private sector worker households**: At least 90 percent of regular household income is in the form of wages from employment in the (formal) private sector;

- **Formal sector worker households**: At least 90 percent of regular household income is in the form of wages from employment in the formal sector;

- **Informal sector worker households**: At least 90 percent of regular household income is in the form of wages from employment in the informal sector;

- **Unemployed households**: All economically active household members are unemployed according to the expanded definition of unemployment; and

- **Households with children**: At least one household member is under the age of 15 years and the household receives a social grant.[5]

Basic descriptive statistics for each of the nine household groups are presented in Table 3. The groups vary significantly in size, from just over 200 000 households (informal sector worker households) to more than 2.3 million households (formal sector worker households). Similarly, population coverage varies from roughly 700 000 to 7.5 million. Apart from formal sector and private sector worker households, the latter being a subset of the former, the largest house- hold groups are unionised worker households (800 000 households, 2.5 million individuals) and unemployed households (670 000 households, 2.5 million individuals).

The third and fourth rows of the table indicate the extent of coverage of the particular group. For example, there are 406 000 grant recipients resident in the group of grant recipient households and this is equivalent to 30.1 percent of all grant recipients in the dataset. Across the nine groups, the coverage rate varies from 20.1 percent (households with children) to 58.1 percent (formal sector worker households). Given that the sample has been trimmed, it is inevitable that rate of coverage will be less than complete and the rate has been further reduced by the implementation of relatively strict criteria across the nine groups. Interestingly, apart from formal sector worker households, the coverage rate is highest for unionised worker households (50.8 percent), private sector worker households (50.8 percent), and public sector worker households (47.6 percent), all three of which are subsets of the formal sector worker household group.

Vulnerable household groups are easily distinguishable from the statistics on expenditure shares, per capita expenditure and the three poverty rates. Mean per capita expenditure ranges between R11 000 and R13 300 per annum for unionised, public

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[5] Various other definitions for each of these groups have been considered. These are presented in Appendix A, along with basic descriptive statistics.

sector, private sector and formal sector worker households, but ranges between R2 400 and R5 300 per annum for grant recipient, unskilled worker, informal sector worker, and unemployed households and households with children.[6] Grant recipient households, unemployed households and households with children are the three poorest household groups in terms of mean per capita expenditure and they also have the highest poverty and ultra-poverty rates. Amongst these groups, roughly seven out of ten households are poor, and nearly four out of ten are ultra-poor. However, while grant recipient and unemployed households have the highest proportion of households in the poorest 40 percent of households (i.e. the highest relative poverty rates) at over 80 percent, this proportion is only 46.9 percent for households with children, which is marginally higher than average. Unskilled worker and informal sector worker households have higher relative poverty rates (76.5 percent and 61.5 percent respectively). In contrast, the household poverty rate is below ten percent for unionised worker and public sector worker households, while the ultra-poverty rate is negligible for unionised worker, public sector worker, private sector worker and formal sector worker households. Interestingly, six of the household groups presented have very similar household sizes, averaging just over three people per household. In contrast, households with children are roughly twice as big (averaging 6.3 people), while grant recipient households and unemployed households are roughly one-fifth to one-quarter larger (4.0 and 3.8 people respectively).

Household Gini coefficients are relatively low within the South African context. Based on the current dataset, the household-level Gini coefficient for urban areas is 0.602 – slightly higher than the World Bank's (2012) 0.631 estimate mentioned earlier) – and 0.493 using the trimmed urban dataset. In contrast, Gini coefficients for the nine household groups ranged between 0.33 and 0.43. Inequality appears to be lowest amongst the vulnerable household groups, with Gini coefficients no more than 0.35, except for informal sector worker households, where inequality is relatively high at 0.42.

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[6] The low per capita expenditure levels of households with children are the direct consequence of requiring households to be in receipt of a social grant. While households with children are not a subset of grant recipient households in terms of the definitions used here, there is overlap: 26.0 percent of households with children are also grant recipient households, and 55.7 percent of grant recipient households are also households with children (using the trimmed samples).

Table 1: Descriptive Statistics for Household Groups, Trimmed Samples

	Grant Recipient	Unskilled Worker	Unionised Worker	Public Sector Worker	Private Sector Worker	Formal Sector Worker	Informal Sector Worker	Unemployed	With Children
Households ('000s)	295	629	804	569	1 417	2 313	229	672	589
Share	4.3	9.2	11.8	8.4	20.8	34.0	3.4	9.9	8.7
Specified Group ('000s)	406	729	1 014	742	1 881	3 318	284	1 081	1 331
Share	30.1	38.8	50.8	47.6	50.8	58.1	24.7	29.7	20.1
Population ('000s)	1 169	1 866	2 505	1 797	4 331	7 477	706	2 536	3 696
Share	4.9	7.9	10.6	7.6	18.3	31.5	3.0	10.7	15.6
Expenditure share	1.1	2.8	11.0	9.1	18.4	36.8	1.4	2.5	4.3
Mean household size	4.0	3.0	3.1	3.2	3.1	3.2	3.1	3.8	6.3
Expenditure p.c.	2 425	3 905	11 447	13 285	11 121	12 863	5 281	2 625	3 063
Household Gini	0.34	0.35	0.37	0.38	0.43	0.41	0.42	0.35	0.33
Poverty rate[1]	71.4	48.7	8.6	7.9	16.4	12.1	39.3	69.8	70.8
Ultra-poverty rate[1]	40.1	18.6	0.0	0.0	0.8	0.0	15.7	37.0	37.3
Relative poverty rate[2]	85.1	76.5	21.4	17.5	33.0	24.6	61.5	81.5	46.9

Source: Own calculations, IES 2000 and LFS 2000:2.
Notes: 1. The household poverty rate is defined as the proportion of households spending less than R322 per capita per month, while the ultra-poverty rate uses a poverty line of R174 per capita per month (both in 2000 prices). Both of these are commonly used poverty lines based on Hoogeveen and Özler (2006).
2. The relative poverty rate refers to the share of households that fall within the 40 percent poorest households using total household expenditure. These four deciles correspond with those calculated in Oosthuizen (2007).

4.2 Expenditure Weights

Once grouped, conventional plutocratic expenditure weights are calculated for each of the nine household groups at the level of elementary aggregate. Weights for the 17 major expenditure categories for all urban households and the nine household groups are presented in Table 3. For all urban households together, food is the expenditure category that accounts for the largest weight, namely 23.7 percent. This is followed by housing (18.6 percent) and transport (15.0 percent). Together, these three categories account for 57.4 percent of the weight in the urban basket. Clothing and footwear (5.0 percent), medical care (4.6 percent), fuel and power (4.4 percent), personal care (4.3 percent) and household operation (4.2 percent) account for a further 22.6 percent of the weight, leaving ten percent of the weight for the remaining categories.

The dominance of food within the expenditure baskets of the nine household groups is clear. For the groups of households described above as vulnerable – grant recipient households, unskilled worker households, informal sector worker households, unemployed households and households with children – the proportion of the expenditure basket accounted for by food ranges from 38.8 percent (informal sector worker households) to 48.3 percent (grant recipient households). For the remaining groups, the weight accounted for by food is somewhat higher than the urban average, although is considerably lower than the range for vulnerable groups. Food accounts for between 24.7 percent and 27.0 percent of expenditure for unionised worker, private sector worker and formal sector worker households. It is only in the case of public sector worker households that the food weight is not statistically different from the urban weight. This higher weighting for food for vulnerable household groups is consistent with Engel's law, which predicts a higher proportion of expenditure dedicated to food

amongst poorer households.

Table 3a: Descriptive Statistics for Household Groups, Trimmed Samples

Aggregate	All Urban	Grant Recipient	Unskilled Worker	Unionised Worker
Food	0.237	0.483*	0.427*	0.257*
	0.0016	0.0087	0.0089	0.0037
Non-Alcoholic Beverages	0.012	0.015*	0.019*	0.014*
	0.0002	0.0011	0.0007	0.0004
Alcoholic Beverages	0.017	0.012*	0.023*	0.018
	0.0004	0.0013	0.0017	0.0008
Tobacco Products	0.014	0.015	0.023*	0.014
	0.0003	0.0013	0.0015	0.0007
Clothing and Footwear	0.050	0.055	0.075*	0.071*
	0.0006	0.0027	0.0023	0.0017
Housing	0.186	0.099*	0.080*	0.160*
	0.0052	0.0053	0.0061	0.0073
Fuel and Power	0.044	0.105*	0.061*	0.044
	0.0005	0.0029	0.0021	0.0012
Furniture and Equipment	0.032	0.020*	0.026*	0.047*
	0.0007	0.0020	0.0019	0.0021
Household Operation	0.042	0.035*	0.034*	0.032*
	0.0009	0.0012	0.0017	0.0014
Medical Care	0.046	0.012*	0.012*	0.050
	0.0011	0.0012	0.0010	0.0022
Transport	0.150	0.034*	0.082*	0.118*
	0.0033	0.0029	0.0035	0.0053
Communication	0.033	0.023*	0.020*	0.028*
	0.0006	0.0016	0.0016	0.0010
Recreation and Entertainment	0.037	0.010*	0.014*	0.035
	0.0009	0.0014	0.0010	0.0015
Reading Material	0.010	0.002*	0.005*	0.010
	0.0004	0.0004	0.0004	0.0008
Education	0.037	0.016*	0.020*	0.046*
	0.0011	0.0020	0.0018	0.0021
Personal Care	0.043	0.059*	0.074*	0.049*
	0.0004	0.0017	0.0020	0.0012
Other Goods and Services	0.009	0.004*	0.006	0.007
	0.0016	0.0004	0.0005	0.0004

Source: Own calculations, IES 2000 and LFS 2000:2.
Notes: 1. Figures in italics are standard errors.
2. An asterisk (*) denotes a statistically significant difference between the weight for a given household group and that of all urban households.

Table 3b: Descriptive Statistics for Household Groups, Trimmed Samples (cont.)

Aggregate	All Urban	Grant Recipient	Unskilled Worker	Unionised Worker
Food	0.237	0.234	0.270*	0.463*
	0.0016	*0.0041*	*0.0036*	*0.0075*
Non-Alcoholic Beverages	0.012	0.012	0.015*	0.017*
	0.0002	*0.0005*	*0.0004*	*0.0007*
Alcoholic Beverages	0.017	0.013*	0.021*	0.012*
	0.0004	*0.0008*	*0.0008*	*0.0010*
Tobacco Products	0.014	0.011*	0.019*	0.018*
	0.0003	*0.0009*	*0.0007*	*0.0012*
Clothing and Footwear	0.050	0.067*	0.061*	0.066*
	0.0006	*0.0021*	*0.0012*	*0.0027*
Housing	0.186	0.169	0.151*	0.081*
	0.0052	*0.0079*	*0.0060*	*0.0039*
Fuel and Power	0.044	0.042	0.044	0.093*
	0.0005	*0.0013*	*0.0010*	*0.0024*
Furniture and Equipment	0.032	0.045*	0.037*	0.021*
	0.0007	*0.0023*	*0.0015*	*0.0021*
Household Operation	0.042	0.032*	0.038	0.035*
	0.0009	*0.0017*	*0.0015*	*0.0012*
Medical Care	0.046	0.051	0.042	0.011*
	0.0011	*0.0028*	*0.0019*	*0.0008*
Transport	0.150	0.145	0.127*	0.043*
	0.0033	*0.0078*	*0.0042*	*0.0028*
Communication	0.033	0.029	0.033	0.021*
	0.0006	*0.0012*	*0.0014*	*0.0012*
Recreation and Entertainment	0.037	0.033	0.034	0.015*
	0.0009	*0.0018*	*0.0021*	*0.0015*
Reading Material	0.010	0.010	0.012	0.005*
	0.0004	*0.0019*	*0.0012*	*0.0008*
Education	0.037	0.053*	0.036	0.026*
	0.0011	*0.0028*	*0.0018*	*0.0023*
Personal Care	0.043	0.045	0.051*	0.068*
	0.0004	*0.0013*	*0.0010*	*0.0017*
Other Goods and Services	0.009	0.007	0.009	0.006
	0.0016	*0.0004*	*0.0007*	*0.0005*

Source: Own calculations, IES 2000 and LFS 2000:2.
Notes: 1. Figures in italics are standard errors.
*   2. An asterisk (*) denotes a statistically significant difference between the weight for a given household group and that of all urban households.*

Table 3c: Descriptive Statistics for Household Groups, Trimmed Samples (cont.)

Aggregate	All Urban	Grant Recipient	Unskilled Worker	Unionised Worker
Food	0.237	0.247*	0.388*	0.418*
	0.0016	*0.0025*	*0.0137*	*0.0063*
Non-Alcoholic Beverages	0.012	0.013	0.019*	0.015*
	0.0002	*0.0003*	*0.0014*	*0.0007*
Alcoholic Beverages	0.017	0.017	0.031*	0.013*
	0.0004	*0.0005*	*0.0032*	*0.0011*
Tobacco Products	0.014	0.015*	0.035*	0.018*
	0.0003	*0.0005*	*0.0037*	*0.0010*
Clothing and Footwear	0.050	0.059*	0.066*	0.081*
	0.0006	*0.0009*	*0.0041*	*0.0027*
Housing	0.186	0.164*	0.072*	0.081*
	0.0052	*0.0045*	*0.0103*	*0.0038*
Fuel and Power	0.044	0.044	0.060*	0.074*
	0.0005	*0.0008*	*0.0033*	*0.0015*
Furniture and Equipment	0.032	0.038*	0.025	0.033
	0.0007	*0.0011*	*0.0033*	*0.0022*
Household Operation	0.042	0.040	0.033*	0.032*
	0.0009	*0.0011*	*0.0022*	*0.0016*
Medical Care	0.046	0.046	0.016*	0.018*
	0.0011	*0.0014*	*0.0038*	*0.0013*
Transport	0.150	0.140	0.097*	0.067*
	0.0033	*0.0037*	*0.0101*	*0.0032*
Communication	0.033	0.031	0.024*	0.025*
	0.0006	*0.0008*	*0.0032*	*0.0011*
Recreation and Entertainment	0.037	0.035	0.025*	0.017*
	0.0009	*0.0013*	*0.0030*	*0.0013*
Reading Material	0.010	0.011	0.009	0.007
	0.0004	*0.0010*	*0.0012*	*0.0014*
Education	0.037	0.043*	0.025*	0.030*
	0.0011	*0.0015*	*0.0040*	*0.0016*
Personal Care	0.043	0.047*	0.066*	0.063*
	0.0004	*0.0007*	*0.0034*	*0.0015*
Other Goods and Services	0.009	0.008	0.006	0.006
	0.0016	*0.0004*	*0.0009*	*0.0003*

Source: Own calculations, IES 2000 and LFS 2000:2.
Notes: 1. Figures in italics are standard errors.
2. An asterisk (*) denotes a statistically significant difference between the weight for a given household group and that of all urban households.

Although the rankings of expenditure categories, excluding food, vary across groups, there is generally a degree of consistency. Two other expenditure categories typically fill out the top three, namely housing and transport. It is only amongst grant recipient households, unemployed households and households with children where this is not the case: household fuel and power is the second largest category for the former two groups, while clothing and footwear ties housing for second in the latter group. Clothing and footwear, housing and food are the only three categories that feature in the top five categories for all groups presented, while transport is in the top five for all but two groups (grant recipient and unemployed households). Personal care ranks in the top five for six of the nine groups.

Amongst grant recipient households, the top five expenditure categories account for 80.1 percent of total expenditure, significantly higher than the share amongst all urban households (67.0 percent). Relative to all urban households, grant recipient households are particularly overweight in household fuel and power – this category's weight is 2.4 times that of all urban households – and food (2.0 times). Grant recipient households also spend proportionately more on personal care and

non-alcoholic beverages. Conversely, relative spending amongst these households on medical care, transport and reading material is between 70 percent and 80 percent lower than that of all urban households. Indeed, in the case of six expenditure category, weights are less than half those of all urban households. The elementary aggregates with the largest weights in the baskets of grant recipient households are typically food items. In particular, white bread, brown and wholewheat bread, mealie meal, beef and veal, poultry and white sugar are amongst the ten largest elementary aggregate weights, accounting for a combined 19.2 percent of expenditure. Electricity (6.7 percent), though, is the item with the largest weight and, together with water and paraffin, accounts for a further 12.8 percent of the basket. Taxi and other hired transport (2.2 percent) is the remaining item within the top ten for grant recipient households. Overall, expenditure patterns for this group of households are statistically different from those of all urban households for 177 out of 229 items, covering 71.9 percent of expenditure.

Expenditure is slightly more concentrated amongst the top five expenditure categories for unskilled worker households than is the case for all urban households (73.7 percent compared to 67.0 percent). Like other vulnerable groups, unskilled worker households are overweight in food (with a weight that is 80.2 percent higher than the all urban weight), personal care (70.1 percent) and tobacco products (65.7 percent). This group, though, spends between 55 percent and 75 percent less relative to their total expenditure on medical care, recreation and entertainment and housing when compared to all urban households. In terms of the weights of elementary aggregates, five food items feature amongst the top ten, namely white bread, brown and wholewheat bread, mealie meal, beef and veal, and poultry, which account for a combined 13.9 percent of expenditure. Cigarettes and women's clothing each account for just over two percent of expenditure. Taxi and other hired transport, though, is the largest elementary aggregate in weight within the basket of unskilled worker households, accounting for 5.1 percent of the total weight. Electricity (3.6 percent) and house rent (2.5 percent) make up the remainder of the top ten items. Differences in elementary aggregate weights between unskilled worker households and all urban households are statistically significant for more than 170 items, covering 76.0 percent of the former group's expenditure.

The top five expenditure categories account for just under two-thirds (65.6 percent) of expenditure for unionised worker households, very similar to that observed for all urban households. At the level of expenditure categories, weights range roughly between 75 percent and 150 percent of all urban weights. Unionised worker households are most overweight in furniture and equipment, clothing and footwear and education (respectively 47.7 percent, 41.5 percent and 22.6 percent higher than the all urban weight). In contrast, weights are between 15 percent and 25 percent lower for household operation, housing, and transport. The elementary aggregate with the largest weight amongst unionised worker households is tuition fees (4.1 percent). Apart from the "other food" item, no food items are found amongst the ten largest expenditure weights. Instead, the highest weighted elementary aggregates are to be found within housing (house rent, building insurance and mortgage insurance), household fuel and power (electricity), transport (new and used vehicles, petrol and diesel, taxi and other hired transport) and medical care (medical aid contributions). The weights of fewer than half (109 out of 229) the elementary aggregates are statistically different between unionised worker households and all urban households, with these aggregates accounting for just 52.3 percent of unionised worker households' expenditure.

Public sector worker households' expenditure patterns are, in aggregate, similar to those of all urban households and the five largest expenditure categories for both groups account for just over two-thirds of total expenditure. Only six expenditure categories have weights that are more than 20 percent higher or lower than the urban weights. Public sector worker households are most overweight in education, furniture and equipment, and clothing and footwear: weights for these categories are between 30 percent and 45 percent higher than the average urban weights. Conversely, alcoholic beverages, household operation and other goods and services have weights that are 20 percent to 25 percent lower than the urban average. At the level of elementary aggregate, tuition fees have the highest weight (4.9 percent), followed by two transport-related items, namely new and used vehicles and petrol and diesel, each of which account for 4.6 percent of expenditure. Other elementary aggregates within the top ten highest-weighted items include assessment rates, building insurance, mortgage insurance and water (all housing items), electricity and medical aid contributions. Only 82 elementary aggregates that account for 40.0 percent of expenditure amongst public sector worker households have weights that are statistically different from the urban average.

Roughly two-thirds of the weight in private sector worker households' expenditure basket is located within the five largest expenditure categories, namely food, housing, transport, clothing and footwear, and education. Overall, aggregate expenditure patterns are very similar to the urban average: there are only four expenditure categories that have weights for private sector worker households that are more than 20 percent different from the average urban weights, and all are categories in which private sector worker households are overweight. These households are most overweight in tobacco products (the weight is 35.5 percent higher than the all urban weight), and are overweight by 20 percent to 25 percent in non-alcoholic beverages, alcoholic beverages and clothing and footwear. Private sector worker households are most underweight in housing (19.0 percent underweight) and transport (15.3 percent). At the level of elementary aggregates, petrol and diesel account for the largest weight in the basket (4.0 percent), followed by electricity (3.7 percent). Other high weight elementary aggregates include, in descending order, tuition fees, house rent, medical aid contributions, building insurance, taxi and other hired transport, and domestic workers, which range in weight from 2.1 percent to 3.3 percent. Less than half of private sector worker households' expenditure is located in elementary aggregates that differ statistically significantly in weight from the all urban weights.

While food accounts for 46.3 percent of unemployed households' expenditure, the next four largest expenditure categories range between six and ten percent of expenditure. Fuel and power is the category that accounts for the second-largest share of the basket for unemployed house- holds (9.3 percent), followed by housing (8.1 percent), personal care and clothing and footwear. Unemployed households appear to differ significantly in terms of expenditure patterns: weights for all expenditure categories, except other goods and services, are statistically different from those of all urban households. Further, the weights of all categories, except household operation, differ by at least 20 percent from their respective all urban weights. Unemployed households appear to be most overweight in household fuel and power, where the weight is 2.1 times the all urban weight, and food, which is just under twice the all urban weight for food. Unemployed households also tend to spend relatively more on personal care, non-alcoholic beverages, clothing and footwear and tobacco products. In contrast, relative to all urban households, unemployed households are underweight in medical care and transport, where weights are less than 30 percent of the all urban weights.

Food accounts for 24.7 percent of expenditure of formal sector worker households, with housing (16.4 percent) and transport (14.0 percent) the next largest expenditure categories. Together with clothing and footwear and personal care, these expenditure categories account for almost two-thirds (65.7 percent) of the weight in the basket for these households. The pattern of expenditure for formal sector worker households is very similar to that of all urban households, with statistically significant differences in weights for only seven of the expenditure categories. Importantly, across the 17 expenditure categories, the formal sector household weights differ from those of all urban households by more than 20 percent in just one instance: this group's weight for furniture and equipment is just over 20 percent more than the all urban weight. Formal sector worker households are slightly overweight in clothing and footwear, education and tobacco products, but underweight in housing. At the level of individual elementary aggregates, the items with the largest weights are petrol and diesel (4.4 percent), new and used vehicles (4.3 percent), tuition fees (3.9 percent) and electricity (3.9 percent). Only 73 elementary aggregates out of 229, covering barely one-third (34.2 percent) of total expenditure, have statistically different weights to the all urban basket.

Informal sector households, by contrast, have very different expenditure patterns to all urban households, with weights for the main expenditure categories differing statistically significantly for all but one category. Food is the category with by far the largest weight, accounting for 38.8 percent of expenditure, while the next four largest categories – transport, housing, clothing and footwear, and personal care – account for between 6.5 percent and 10.0 percent of expenditure. Weights for all expenditure categories, except for reading material, are at least 20 percent different from the all urban weights. Informal sector households are most overweight in tobacco products, where the weight is 2.5 times that of all urban households. Other particularly overweight items are alcoholic beverages (187.8 percent of the all urban weight), food (163.8 percent), non-alcoholic beverages (152.9 percent) and personal care (150.9 percent). These households are also most underweight in medical care and housing: both weights are less than two-fifths of the corresponding all urban weights. The elementary aggregates with the highest expenditure weights are electricity (3.6 percent), poultry (3.2 percent), taxi and other hired transport (3.2 percent), petrol and diesel (2.8 percent) and cigarettes (2.7 percent). At this level of disaggregation, weights are statistically different from the all urban weights for 131 of the 229 items, accounting for close to three-fifths of the total weight in informal sector households' basket.

Nearly three-quarters (72.2 percent) of the spending of households with children is concentrated within five expenditure categories, namely food, clothing and footwear, housing, fuel and power, and transport. Food has the highest weight of the 17 categories, accounting for 41.8 percent of total expenditure, while the next four largest categories range in weight between 6.7 percent and 8.1 percent. Of the 17 expenditure categories, weights differ statistically significantly between households with children and all urban households in the case of 14. While these differences are statistically significant, they are also generally substantial: weights are at least 20 percent different from those of all urban households for all categories, except furniture and equipment and education. Households with children are most overweight in food (the weight for households with children is 76.4 percent higher than the corresponding weight for all urban households), fuel and power (70.1 percent higher) and clothing and footwear (60.7 percent). Conversely, households with children are most underweight in medical care (60.9 percent lower), transport (55.7 percent lower) and recreation and entertainment (52.9 percent lower). Amongst the 229 elementary aggregates in the price index, those with the highest weights are electricity (5.5 percent), poultry (3.6 percent), taxi and other hired transport (3.3 percent), brown and wholewheat bread (2.9

percent) and tuition fees (2.7 percent). More than three-quarters of the expenditure of households with children is located within elementary aggregates that have weights that are statistically different compared with the all urban weights.

Overall, poorer household groups tend to have a much larger proportion of their budgets dedicated to food – typically between 40 percent and 50 percent – than do better-off household groups and all urban households as a group. This category then dominates within the overall structure of expenditure, with few groups having other expenditure categories with weights of more than ten percent. This higher weight exposes poorer household groups to food inflation. Poorer household groups also tend to have relatively greater exposure to inflation from non- alcoholic beverages, tobacco products, clothing and footwear, household fuel and power and personal care items, through their relatively large weights for these expenditure categories.

4.3 Inflation Experiences across Household Groups

4.3.1 Inflation for All Urban Households

The expenditure weights calculated for each of the types of households described above are used to weight the price data obtained from Statistics South Africa, to arrive at price indices. From these price indices, the rate of inflation for each group of households can be calculated. Year-on-year inflation rate trends for different types of households are described in this section.

Year-on-year inflation rates for all urban households between 1998 and 2008 are presented in Figure 2. The overall inflation rate between 1997 and 2008, calculated using the mean indices for those years, is just under 7.5 percent and is indicated by the horizontal dashed line. During the early part of the period, year-on-year inflation remained quite close to, though slightly higher than, the average inflation rate for the period as a whole. Inflation picked up somewhat during 2000, breaching nine percent and remaining there for six months from April 2000. Having fallen back to the period average by mid-2001, however, the inflation rate surged once again, this time in response to a rapid depreciation of the Rand during late 2001 and accelerating unit labour costs (South African Reserve Bank, 2002, 2). Major contributors to inflation during this time were food and fuel prices. By its peak in October 2002, the inflation rate reached 11.2 percent, 3.7 percentage points above the period average.

After this period of high inflation, however, the inflation rate fell rapidly and, within 12 months, had fallen to 5.4 percent, less than half its peak rate. This rapid decline was the result of falling food prices generally, and grain prices in particular, and heralded a period of sustained lower inflation: for the three years from 2004 to 2006, year-on-year inflation rates rarely breached five percent by any significant margin. By mid-2007, inflation was on the rise, in line with global inflationary pressures. In its review of the economy, the South African Reserve Bank (2008, 15) pointed to particular inflationary pressures deriving from "[soaring] food prices, a further surge in international prices of crude oil, the depreciation of the external value of the rand and domestic supply constraints in certain sectors". At its peak of 14.0 percent in August 2008, the inflation rate was nearly twice the period average.

The period from 1998 to 2008, therefore, is characterised by a relatively high average inflation rate of 7.5 percent. Year-on-year inflation rates were close to average for the first four years of the period. However, inflation rates rose significantly above the average rate during 2002/2003 and during 2008, periods that are separated by a sustained relatively low rate of inflation.

Figure 2: Inflation Rate for All Urban Households, 1998–2008
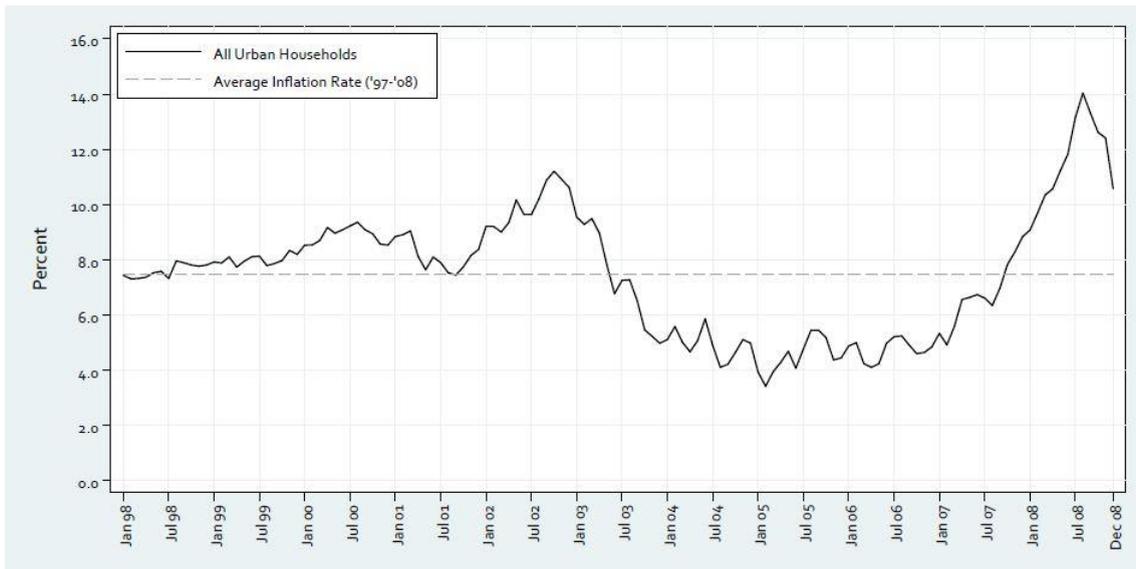
Source: Own calculations, IES 2000 and LFS 2000:2.
Notes: The inflation rate is calculated as a monthly year-on-year inflation rate.

4.3.2 Inflation for Household Groups

Figures 3 and 4 present year-on-year inflation rates for the nine household groups defined above. Each graph in the figures presents the year-on-year inflation rate for the particular household group, along with that of all urban households, with the area graph depicting the difference between the two (i.e. the group-specific rate minus the all urban rate). All nine household groups display broadly similar inflation trends over the period, compared to all urban households and each other. The key difference across groups, then, is the extent of the gap in inflation rates relative to all urban households at peaks and troughs in the inflation cycle.

Patterns of inflation over the period across the household groups clearly divide these groups into two types, which coincide with the idea of 'vulnerable groups' raised earlier. Specifically, grant recipient households, unskilled worker households, informal sector worker households, unemployed households, and households with children all see significant deviations from the all urban inflation rate around the peaks around mid-2002 and from mid-2006 onwards, and around the troughs of late 1999, early 2001 and 2004/2005. Amongst vulnerable groups, grant recipient households and unemployed households appear to be most similar, with the greatest upside deviations observed during the inflation peaks. In October 2002, for example, the inflation rate for all urban households peaked at 11.2 percent. At that time, inflation for each of these five groups was higher, the gap being between 2.0 percentage points and 3.4 percentage points. Thus, in that month, the inflation rate for informal sector worker households was 13.2 percent, rising to 14.6 percent for grant recipient households.

The gap between the inflation rates of these household groups and all urban households was even larger in late 2008: in December 2008, grant recipient households experienced an inflation rate of 16.8 percent, 6.2 percentage points higher than the all urban average and 2.6 percentage points more than that of informal sector worker households, which experienced the lowest inflation rate amongst vulnerable groups in that month. During periods of low average inflation, too, there were relatively large gaps in the respective inflation rates. In October 2004, with all urban inflation at

4.6 percent, inflation rates for these five house- hold groups ranged between 2.1 percent (grant recipient households) and 3.4 percent (informal sector worker households). [7]

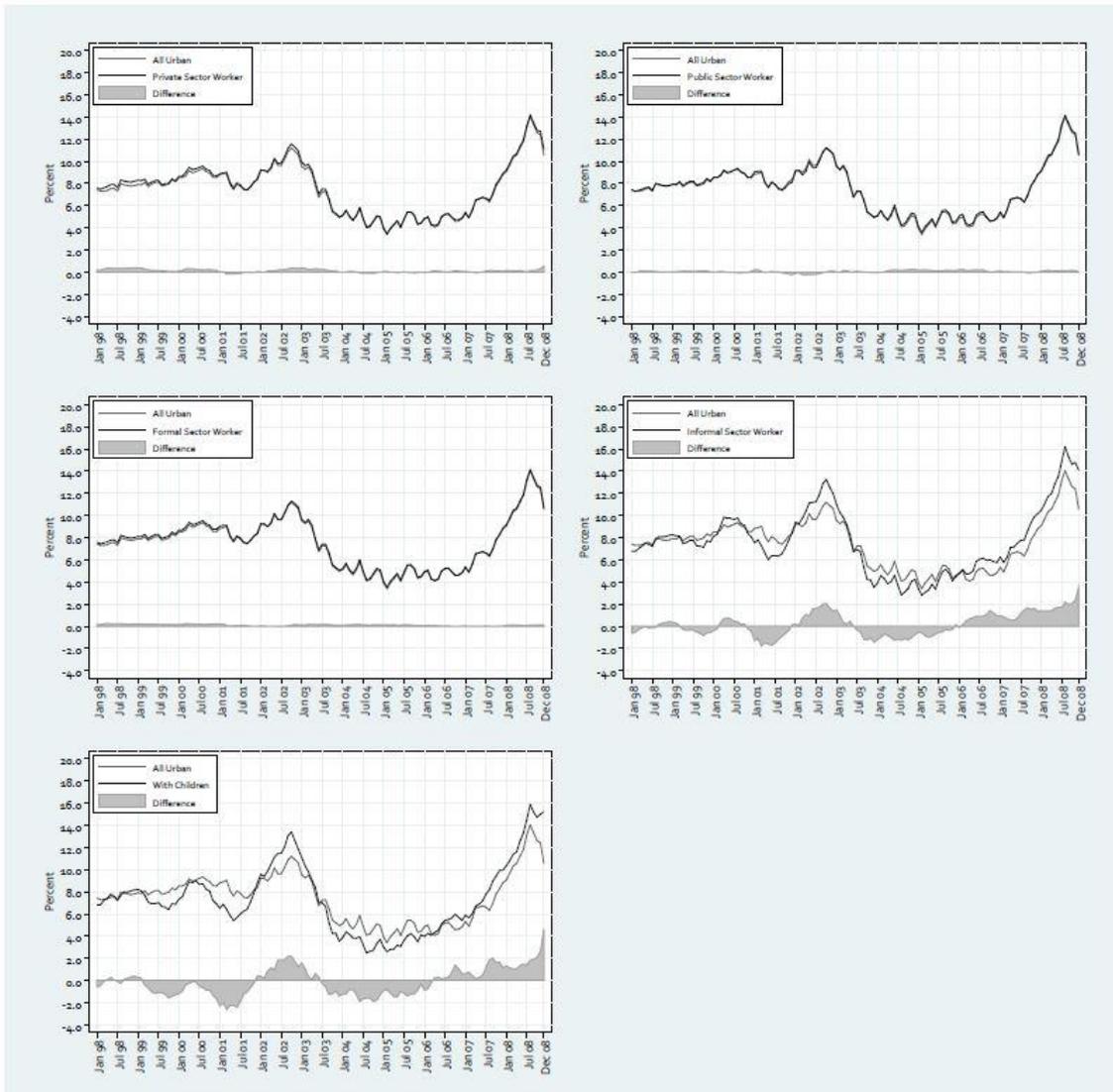**Figure 3: Inflation Rate for Household Groups, 1998–2008**
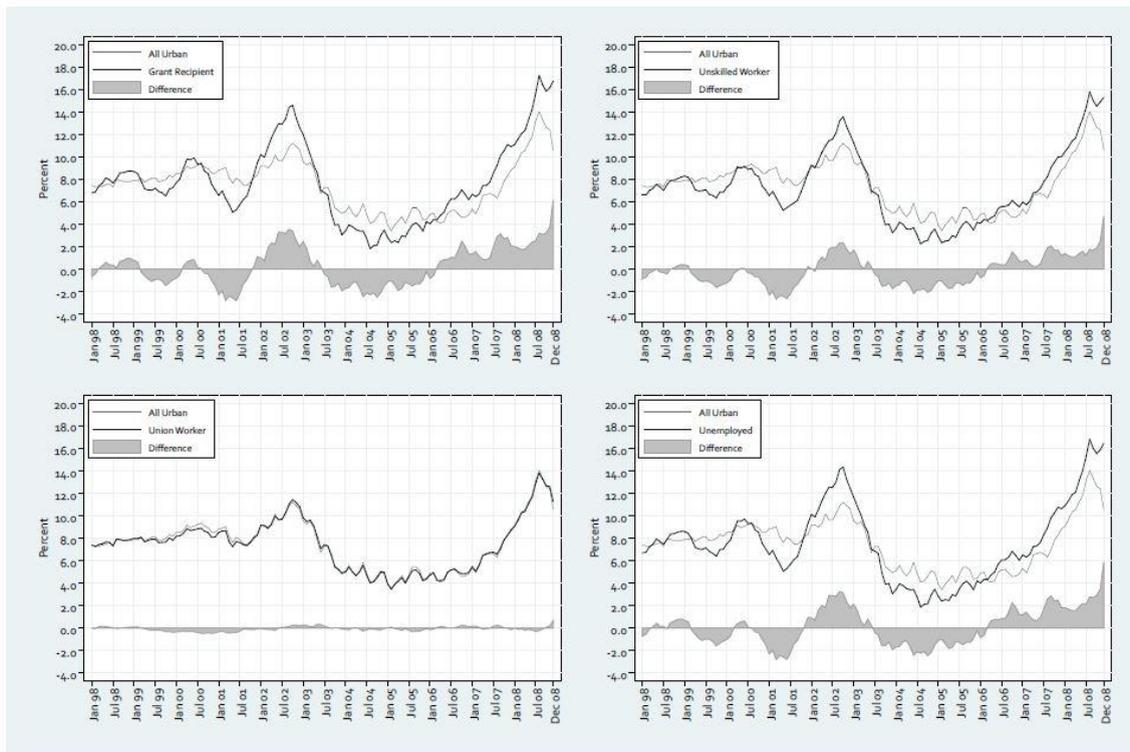
Source: Own calculations, IES 2000 and LFS 2000:2.
Notes: The inflation rate is calculated as a monthly year-on-year inflation rate.

For this subset of vulnerable groups, this pattern of wider fluctuations in the inflation rate is not unexpected. Since each of these household groups are relatively poor and have relatively high poverty rates, the weight for food within their expenditure baskets is relatively high (as noted earlier). Further, these groups tend to have relatively greater exposure to the effects of price changes for goods such as paraffin, the prices of which tend to be relatively volatile and which often move with those of food.

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[7] This gap is at its largest during early 2001, when the inflation rate for unemployed households (in March 2001) and grant recipient households (in June 2001) fell to more than 2.8 percentage points below the all urban inflation rates of 9.0 percent and 8.1 percent respectively.

Figure 4: Inflation Rates for Household Groups, 1998–2008

Source: Own calculations, IES 2000 and LFS 2000:2.
Notes: The inflation rate is calculated as a monthly year-on-year inflation rate.

The second set of household groups is comprised of union worker households, formal sector worker households, and private and public (formal) sector households. Amongst these household groups, the deviation from the all urban inflation rate is minimal and remains so through the various inflation peaks and troughs. Across all four household groups and the entire period, the maximum deviation was less than 0.7 percentage points above and less than 0.5 percentage points below the all urban average, compared to 6.2 percentage points and 2.9 percentage points respectively for the vulnerable groups.

4.3.3 Inflation Inequality and Group-Specific Price Indices

Section 4 of this paper has concentrated on deriving group-specific price indices for different types of households. The motivation for this has been to ascertain the extent to which the inflation rates for different types of households may have differed from the all urban inflation rate. This information is important from a policy perspective in the areas of wage bargaining and minimum wage setting, as well as in the adjustment of the nominal values of state welfare grants over time.

In this analysis, price data is not differentiated according to the type of household. In other words, variations in inflation rates across households can only arise through differing expenditure patterns. The analysis therefore presumes that expenditure patterns vary systematically with household characteristics and that these differ from the pattern of aggregate expenditure. This paper has focussed on categorising households according to the labour market characteristics of their members, as well as receipt of state welfare grants and the presence of children in the household.

Group-specific inflation statistics are provided in Table 4, covering each of the seven household groups presented above. Between January 1997 and December 2008, total inflation for all urban households was 134.8 percent. However, there is substantial variation across household groups. While the inflation rate for unionised worker households over the period – 134.7 percent – was almost identical to the all urban rate, grant recipient households experienced an inflation rate that was almost 14 percentage points higher than the all urban rate, at 148.7 percent. Grant recipient households are followed by unemployed households and informal sector worker households, which experienced inflation of 145.8 percent and 143.0 percent respectively over the 12-year period.

These differences are, to some extent, also reflected in the mean monthly year-on-year inflation rate over the period, calculated as the simple average of the individual monthly values of year-on-year inflation. However, the mean monthly rate reveals that even though some groups had relatively high total inflation over the period, these were driven by relatively few high monthly year-on-year inflation values. While grant recipient households, informal sector worker house- holds and unemployed households all had mean monthly year-on-year inflation rates of more than 7.6 percent, with total inflation of at least 143.0 percent, private sector worker households and formal sector worker households had similar monthly year-on-year inflation rates, but substantially lower total inflation rates. Households with children, for example, have a relatively low mean monthly inflation rate (7.37 percent), lower than that of all urban households, yet the former group's total inflation rate is more than three percentage points higher than the latter's.

The variability of monthly year-on-year inflation rates, as measured by the standard deviation, is revealed to be higher for poorer household groups. For all urban households, the standard deviation is just under 2.3 percentage points, but it exceeds 3.4 percentage points for grant recipient households and unemployed households, which are two of the poorest groups considered here. In contrast, unionised worker households, public sector worker households and formal sector worker households have standard deviations that are either lower or marginally higher than the average for all urban households. This is a similar finding to that of McGranahan and Paulson (2006, 34) who find that vulnerable groups in the US were prone to greater variability in the rate of inflation experienced.

Table 4: Group-Specific Inflation Statistics, 1997–2008

Group	Total Inflation (Percent)	Monthly Year-on-Year Inflation Rate			Mean Difference between Group and All Urban Monthly Inflation Rates (Percentage Points)		
		Mean (Percent)	Std.Dev.	Months Above Average	Full Period	High Inflation	Low Inflation
All Urban	134.8	7.49	2.287	-	-	-	-
Grants	148.7	7.74	3.565	72	0.252	1.396	-0.575*
Unskilled	136.9	7.32	3.159	60	-0.174	0.620	-0.687*
Unionised	134.7	7.43	2.279	50	-0.058	-0.099	-0.029
Private	138.7	7.61	2.358	104	0.120	0.188	0.016*
Public	135.8	7.55	2.255	99	0.058	0.022	0.127*
Formal	137.5	7.60	2.296	120	0.108	0.112	0.084
Informal	143.0	7.66	2.978	69	0.174	0.912	-0.220*
Unemployed	145.8	7.63	3.466	70	0.143	1.205	-0.606*
Children	137.9	7.37	3.118	61	-0.123	0.603	-0.622*

Source: Own calculations, IES 2000 and LFS 2000:2.
Notes: 1. Total inflation is the total inflation rate between January 1997 and December 2008. The mean monthly inflation rate is a simple average of the year-on-year inflation rates for each month of the period.
2. High (low) inflation months are those months where the year-on-year inflation rate for all urban households is more than one percentage point above (below) the mean inflation rate for all urban households between 1997 and 2008 (using the mean indices for the respective years).
3. Asterisks denote groups for which the mean difference between the group-specific and all urban monthly year-on-year inflation rates during high inflation periods is statistically different from that during low inflation periods at the 99 percent (*) level of confidence.

The fourth data column of the table indicates the number of months in which the group-specific inflation rate exceeded the all urban inflation rate. There is a significant degree of variation, with group-specific inflation rates exceeding the average in as few as 50 months (unionised worker households) and as many as 120 months (formal sector worker households) during the 132-month period. There is no clear relationship between total inflation and the number of months the group-specific year-on-year inflation rate exceeds that of all urban households. Nevertheless, the three groups with the highest total inflation rate – grant recipient households, unemployed households and informal sector worker households – have inflation rates above the all urban average for just over half the period (between 69 and 72 months). This confirms again that inflation for these groups is characterised by short periods of very high inflation, rather than longer periods of 'moderately' high inflation. For formal sector and private sector worker households, the somewhat higher total inflation rate for the period is driven by long periods of slightly higher than average inflation rates.

The final three columns of the table consider the potential relationship between group-specific and all urban inflation rates in different inflation circumstances. First, the difference between the group-specific and the all urban inflation rate is evaluated over the full period between January 1997 and December 2008, and then it is evaluated during periods of relatively high and periods of relatively low inflation. High (low) inflation months are defined, somewhat arbitrarily, as those months where the year-on-year inflation rate for all urban households is more than one percentage point above (below) the mean inflation rate for all urban households between 1997 and 2008 (calculated using mean indices for the two years). For the full period, all household groups except unskilled worker households, unionised worker households and households with children have positive mean differences, indicating that monthly group-specific inflation rates tend to be higher than that of all urban households.

However, splitting the period into high and low inflation periods confirms the vulnerability of poorer household groups. In high inflation periods, the difference for almost all household groups is positive, indicating that these groups tend to have higher rates of inflation than the overall urban population when inflation is relatively high. For some groups, the difference is negligible: 0.02 percentage points for public sector worker households and 0.11 percentage points for formal sector worker households. However, the difference is almost 1.4 percentage points for grant recipient households, 1.2 percentage points for unemployed households and 0.9 percentage points for informal sector worker households. In low inflation periods, these differences are negative, with grant recipient households, unskilled worker households, unemployed households and households with children all having lower than average inflation rates by between 0.5 and 0.7 percentage points. This pattern of positive differences during periods of higher inflation and negative differences during periods of lower inflation is consistent with the earlier observation of greater variability in the rate of inflation amongst these household groups than is the case within the broader urban population.

The differences in the total inflation rates across these groups are not very big, the largest gap being 13.9 percentage points for grant recipient households. In practice, this means that a grant with a value of R100 in 1997 would be worth just over R94 in real terms in 2008 if its nominal value was adjusted using the all urban CPI rather than the grant recipient household CPI. This is not a large loss in purchasing power, although it is certainly arguable that it is potentially a significant loss over longer periods of time for poor households and that poor households lack the ability to cushion themselves against the effects of such a loss. However, over shorter periods of time, the exact timing of adjustments may have important implications. Take the period between January 2002 and January 2003, for example. The real value of a grant would have declined by 4.4 percent over the period based on the all urban CPI, compared to 5.9 percent based on the grant recipient household index. The difference – 1.4 percentage points – is equivalent to nearly one-third of the loss under the all urban CPI.

Perhaps the key finding in section 4 is that, although group-specific year-on-year inflation rates may differ significantly from the all urban inflation rate, this seems to have more to do with the extent of poverty within the group rather than with a specific non income related behavioural difference. The groups where inflation rates were significantly different from the all urban inflation rate were grant households, unskilled worker households, informal sector worker households, unemployed households, and households with children. In the case of each of these groups, there is an a priori expectation that these households are relatively poor and, as a result, their consumption patterns are likely to differ from the urban average. This finding, though, should not be entirely unexpected, given that the comparator group – all urban households – essentially reflects the consumption patterns of households near the very top of the income distribution. On the other hand, some group-specific price indices are virtually indistinguishable from the all urban inflation rate. For the groups analysed here, this is true of unionised worker households, formal sector worker households and, to a lesser extent, public and private formal sector workers. There are at least two reasons for this. The first reason is that these groups may be comprised of relatively well-off households and, as a result, their spending patterns are unlikely to differ significantly from the urban average. The second reason is that these groups are not narrowly defined enough to isolate unique group-specific expenditure patterns that would differentiate them from the urban average.

Unionised worker households certainly represent an interesting case in this context in that the inflation rate for this group is not much different from the all urban inflation rate. This is likely to be the result of the broad spectrum of workers that belong to trade

unions in South Africa, with large numbers of relatively well-paid public sector workers belonging to public sector trade unions. From an applied perspective, this means that wage negotiations may quite appropriately be conducted on the basis of the all urban inflation rate instead of using a group-specific rate if they involve a broad range of workers, such as in the case of the public sector. For grant households, the adjustment of the nominal values of grants using the all urban CPI will certainly lead, over time, to both under- and over-adjustments relative to the adjustment required to keep purchasing power constant (as measured by the group-specific price index). This is particularly true when using those definitions that isolate poorer sub-groups amongst grant households.

5. INFLATION INEQUALITY AT THE HOUSEHOLD LEVEL

Group-specific price indices are not the only way of monitoring inflation inequality across different types of households. Given the concerns relating to the distortions in average expenditure weights within societies (or even household groups) characterised by high levels of inequality, it is useful to track inflation at the level of the individual household. This section investigates the extent to which there is variation across households in the rates of inflation they experience over time.

Figure 5 presents the distribution urban households over annual inflation rates for each year from 1998 to 2008. Annual inflation rates are calculated as the percentage change in a household's mean price index across the 12 months from one year to the next. On the far right of the figure is the boxplot for average annual rate of inflation for all households for the full 1997-2008 period. The median inflation rate for the period was just under 7.5 percent, with the first and third quartiles at 6.7 percent and 8.2 percent. The interquartile range is, therefore, estimated to be 1.5 percentage points. The top adjacent value, calculated as the third quartile plus 1.5 times the inter-quartile range, is 10.5 percent, while the lower adjacent value is 4.4 percent.

Figure 5: Boxplots of Annual Inflation Rates, 1997–2008
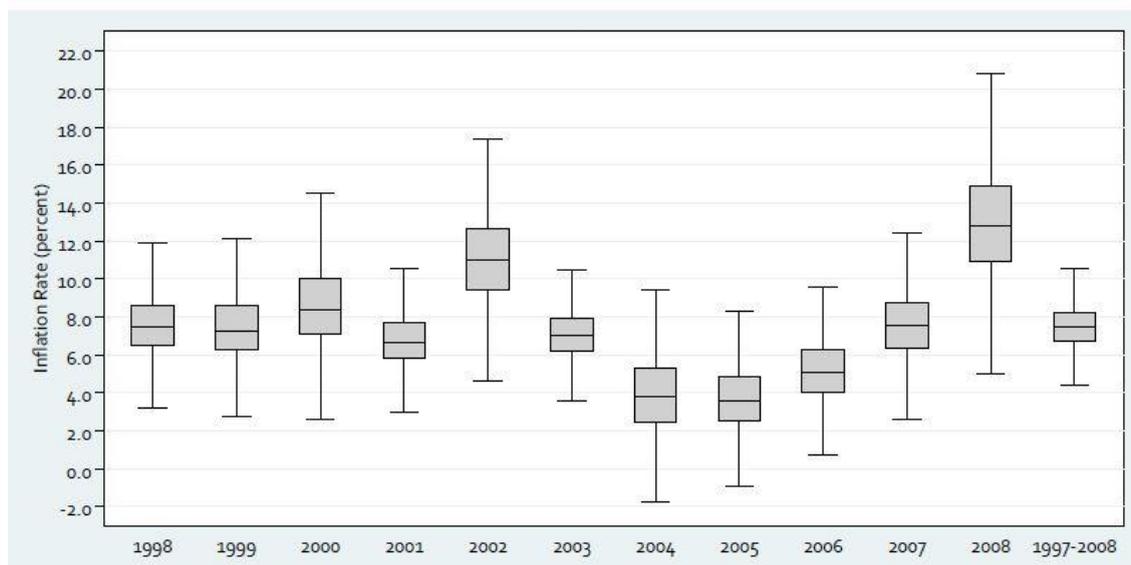
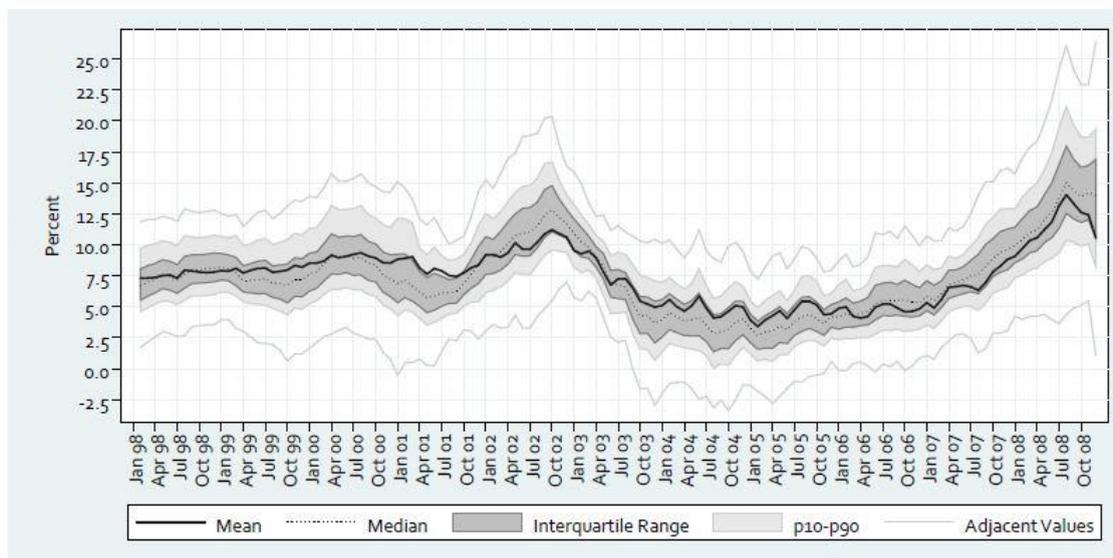*Source: Own calculations, IES 2000.*
Notes: Outliers beyond the adjacent values, calculated as the first quartile minus 1.5 times the interquartile range and as the third quartile plus 1.5 times the interquartile range, are not shown here.

Compared to the boxplots for the individual years, the distribution of the average annual inflation rates is narrow: the gap between the upper and lower adjacent values is 6.1

percentage points, compared to between 6.9 percentage points and 15.8 percentage points for the 11 individual years. While the interquartile range averages 2.6 percentage points across the 11 years, it was as narrow as 1.7 percentage points (2003) and as wide as 4.0 percentage points (2008). In other words, the interquartile range for annual inflation rates in individual years can be more than 2.5 times that of inflation rates for the period as a whole, and as little as 13 percent wider. There does not appear to be a trend in the level of dispersion of household-level inflation rates over time, nor at first sight does there appear to be a strong relationship between the level of dispersion of inflation rates and the median inflation rate. However, while a simple OLS regression finds no evidence of a relationship between time and dispersion (as measured by the interquartile range), there does appear to be a positive relationship between the median inflation rate and the interquartile range. Specifically, a one percentage point increase in the median inflation rate is associated with a 1.8 percentage point increase in the interquartile range, the coefficient being statistically significant at the 95 percent level.

The annual inflation rates used above disguise much of the variation that exists within the data by consolidating the data into just 11 points, whereas there are 144 months' worth of price indices. Keeping to year-on-year inflation rates, Figure 6 presents the distribution of household inflation rates for 132 months from January 1998 to December 2008. Using monthly data, the positive relationship between the median inflation rate and the degree of dispersion is much clearer. A simple OLS regression with the median inflation rate as the explanatory variable and a dispersion measure as the dependent variable indicates that a one percentage point increase in the median inflation rate is associated with a 0.15 percentage point increase in the interquartile range and a 0.59 percentage point increase in the range between the upper and lower adjacent values.

Figure 6: Distribution of Household Inflation Rates Relative to Mean and Median Inflation Rates, 1998–2008

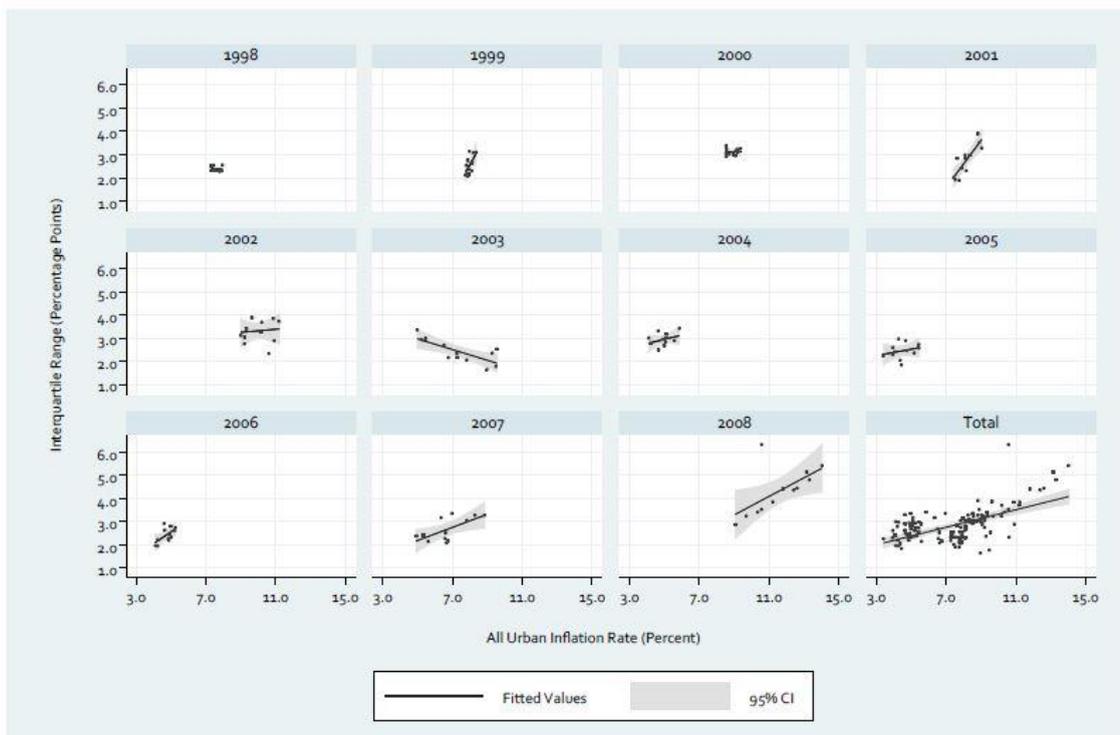
Source: Own calculations, IES 2000.
Notes: Adjacent values are calculated as the first quartile minus 1.5 times the interquartile range and as the third quartile plus 1.5 times the interquartile range.

The figure also shows the varying gap between the mean and median inflation rates over time.   The mean inflation rate – calculated here as the mean across urban households of the year-on-year inflation rate – for example, is higher than the median during late 1999 and early 2000, from late 2000 until late 2001, and from mid-2003 until mid-2006. During these periods, the weight of the distribution is located below the mean, but there are significant outliers above the mean. Conversely, in the periods

where the mean is located below the median, the weight of the distribution is located above the mean, with the significant outliers located below the mean. This unevenness in the distribution is particularly marked in the 2001, when the mean is located outside of the interquartile range, and during much of the period from mid-2002 to mid-2005, when the mean is located very close to the edge of the interquartile range.

In Figure 7, the possibility of a relationship between the dispersion of household-specific inflation rates and the level of inflation is probed a bit further. The figure plots the observed interquartile range against the all urban inflation rate for each month from 1998 to 2008, with the results of a simple linear model fitted to the data in each period. The lower righthand panel within the figure presents the data for the full 132-month period and finds a positive relationship between the level of inflation and the degree of dispersion as measured by the interquartile range. For the period as a whole, a one percentage point increase in the all urban inflation rate is associated with a 0.19 percentage point increase in the interquartile range.

Figure 7: Dispersion of Household Inflation Rates Relative to All Urban Inflation Rate, 1998 – 2008
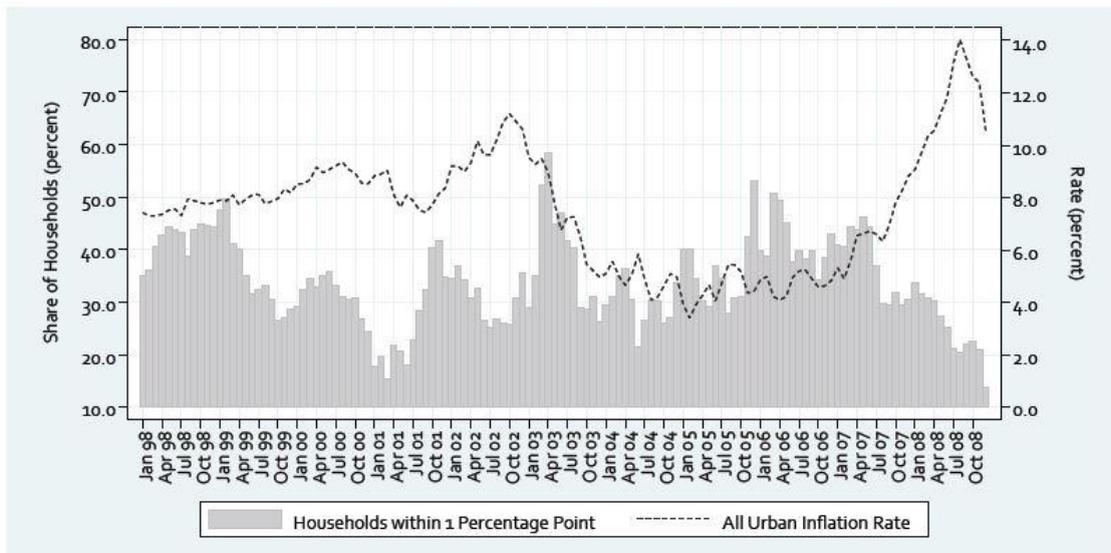

Source: Own calculations, IES 2000.

For the individual calendar years, the relationship between the all urban inflation rate and the interquartile range is typically positive, with only 2003 exhibiting a statistically significant negative relationship (the coefficient in 1999 is also negative, but is not significant). Positive significant coefficients are observed in 1999, 2001 and 2006 to 2008. Generally, therefore, increases in the all urban inflation rate are associated with greater dispersion in household-specific inflation rates.

Another way to gauge the extent to which the all urban inflation rate is reflective of households' inflation rates is by looking at the proportion of households whose inflation rates are close to the average. Obviously, 'close' is context-specific. Here, 'close' is defined as within one percentage point. Figure 8 presents the proportion of households within one percentage point of the all urban inflation rate for the 132-month period. On

average, roughly one-third (33.9 percent) of urban households experienced rates of inflation within one percentage point of the all urban inflation rate. However, this proportion varies quite substantially: in December 2008, just 13.8 percent of households fell within one percentage points of the all urban inflation rate, while in April 2003 the proportion was 58.5 percent. In 31.1 percent of the months, less than 30 percent of households were located within one percentage point of the all urban inflation rate, while fewer than one-third of households were located within one percentage point in 50 percent of the months. In just four months (less than three percent of the months) were more than 50 percent of households located within one percentage point of the all urban inflation rate.

Figure 8: Proportion of Households within One Percentage Point of All Urban Inflation Rate, 1998–2008
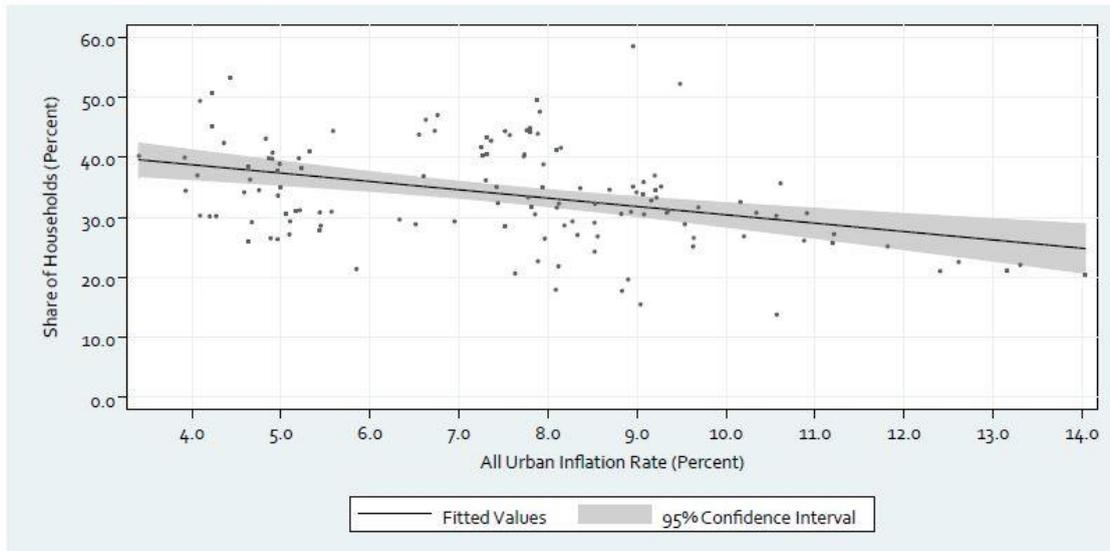

Source: Own calculations, IES 2000.

These proportions appear to be very low: in any given month, there is a high probability that more than one-half of households will experience rates of inflation that are not within one percentage point of the all urban inflation rate. In other words, it is very rare in the data presented that the majority of households experience rates of inflation within one percentage point of the mean. However, this may not be unusual. For example, using annual UK data between 1976 and 2000, Crawford and Smith (2002, 10) find that only 35 percent of households have inflation rates within one percentage point of the average, with a range of between nine and 65 percent. All three figures – the mean and the upper and lower bounds – are very similar to those for South Africa between 1998 and 2008, despite the wider range of mean inflation rates observed in the UK data (from less than one percent to more than 19 percent).

Over the period under review, there is evidence of a relationship between the level of the all urban inflation rate and the proportion of households within one percentage point of that rate. This can be seen in Figure 9, the solid line indicating the negative relationship. For the period as a whole, a one percentage point increase in the all urban inflation rate is associated with a 1.4 percentage point decline in the proportion of households located close to the mean inflation rate. This negative relationship is also observed in separate regressions in low (less than six percent), medium (six to 10 percent) and high (10 percent plus) inflation periods.

Figure 9: All Urban Inflation Rate versus the Share of Households within One Percentage Point of the Mean, 1998–2008
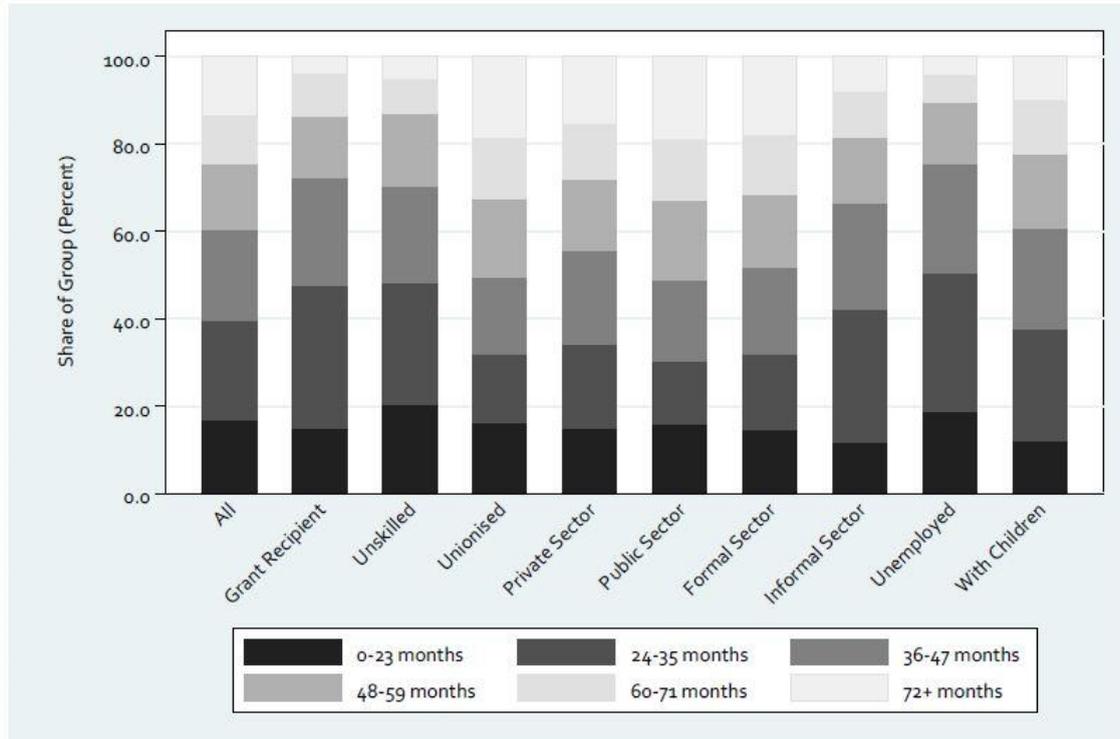

Source: Own calculations, IES 2000.

One of the somewhat unexpected results is the low proportion of households for which the all urban inflation rate is a close approximation of their own household-specific inflation rates. The data presented above reveals that it was very rare during the period between 1998 and 2008 that the majority of households were located within one percentage point of the all urban inflation rate (four out of 132 months). Further, in half of the months during the period, fewer than one-third of urban households were located within one percentage point of the all urban inflation rate. This finding, then, may provide some analytical credence to the claims heard regularly within the broader public discourse that the headline inflation rate is a poor proxy for the household-specific inflation rates of a large proportion of urban households.

Interestingly, though, it is poorer households who appear more likely to have spent longer periods of time beyond one percentage point of the mean. The average urban household experienced a rate of inflation that was within one percentage point of the all urban inflation rate in 59 months out of 132 (44.8 percent). Across the various household groups, this ranged between 50 and 68 months but is typically lower for poorer household groups. Thus, the ten groups that spend the lowest number of months (50 to 55 months) within one percent of the all urban inflation rate are either grant households, unskilled worker households, informal sector worker households or unemployed households. Conversely, the ten groups that spend the highest number of months within the range (64 to 68 months) are either unionised worker households, private sector worker households, public sector worker households or formal sector worker households.

This difference is not the result of a small number of outliers. Considering the duration that households are located within the one percentage point boundary, Figure 10 presents the distribution of households across six categories spanning from 0 to 23 months, to 72 months or more. For the most part, the proportion of households that are located within one percentage point of the all urban inflation rate is relatively stable across groups. Overall, 16.9 percent of households spend less than two years within one percentage point of the all urban inflation rate, while 13.6 percent spent at least six years within the range. The two modal categories are 24 to 35 months (22.7 percent of households) and 36 to 47 months (20.9 percent).

Figure 10: Distribution of Households by Time Spent Within One Percentage Point of the All Urban Inflation Rate, 1998–2008

Source: Own calculations, IES 2000 and LFS 2000:2.
Notes: This figure is available in tabular form in Appendix D.

Amongst poorer household groups, though, these modal categories generally account for relatively large shares of households. While these two categories account for 43.6 percent of all urban households, this proportion rises to more than 55 percent for several groups, particularly amongst the informal sector worker household and unemployed household groups. Amongst unionised worker, public sector worker and formal sector worker households, however, this proportion falls to between 32 percent and 38 percent. Perhaps most telling is the combined proportion of house- holds that are located within one percentage point of the all urban inflation rate for less than 60 months. Amongst all urban households, this proportion is 75.3 percent, but is above 85 percent for eight household groups notably unskilled worker and unemployed households. For unionised worker, formal sector and public sector worker households, this proportion is typically below 68 percent. This means that there is a substantially higher proportion of households in better-off households groups within the one percentage point range for at least 60 out of the 132 months.

6.   CONCLUSION

The inflation rate is one of the central macroeconomic indicators in societies around the world. Prices are a critical variable in translating nominal income into welfare and, as such, consumer price indices are used internationally to compensate economic agents for losses in purchasing power over time. In South Africa, for example, the CPI informs decisions surrounding the adjustments of minimum wages and the monetary value of social grants, as well as the process of collective bargaining.

This paper presents expenditure weights and inflation rates for various household groups, namely grant recipient households, unskilled worker households, unionised

worker households, public and private sector worker households, formal and informal sector worker households, households with unemployed members, and households with children. These groupings were chosen in terms of their policy relevance, but also so as not to duplicate price indices published by Statistics South Africa.

While inflation for all urban households between January 1997 and December 2008 totalled 134.8 percent, there was substantial variation across household groups. Grant recipient households and unemployed households respectively experienced rates of inflation over the period 14.9 percentage points and 11.0 percentage points higher than the all urban rate. In contrast, various household groups experienced inflation rates that were very similar to that of all urban households, including unionised worker households and public sector worker households.

In terms of the results of the analysis, these household groups can be broadly split into two groups: the first consists of grant recipient households, unskilled worker households, informal sector worker households, unemployed households and households with children; the second consists of unionised worker households, public and private sector worker households, and formal sector worker households. For the latter group, although there were statistically significant differences in the weight structures relative to the all urban weight structure, there was very little difference in the monthly year-on-year inflation rates. These groups are typically relatively wealthy and their monthly year-on-year inflation rates tend to be less volatile.

For the former group, though, statistically significant differences in weight structures were more prevalent, while monthly year-on-year inflation rates were often considerably more volatile. This volatility was observed in terms of these groups' higher standard deviations, which were often more than one-third higher than that of all urban households. This greater degree of volatility is further confirmed for all of these household groups by comparing the mean differences between group-specific and the all urban inflation rate: it was shown that during high inflation months their inflation rates exceeded the all urban rate, while in low inflation months their inflation rates were below the all urban rate.

One of the key findings from the analysis of the group-specific inflation rates is that where there are significant differences between the group-specific and the all urban inflation rate, this appears to have more to do with the relative poverty of the group rather than with a specific behavioural difference in consumption. Lower incomes (and therefore greater poverty) are associated with larger expenditure weights categories such as food, household fuel and power (particularly electricity and paraffin) and personal care, and items within these categories are often prone to rapid changes in price within small periods of time.

From a policy perspective, the analysis above sheds some light in terms of the suitability of making adjustments to nominal amounts using the overall CPI. When making adjustments to the nominal values of welfare grants, for example, it is clear that the overall CPI is not the best index to use: for the period under analysis, inflation for grant recipient households was higher, sometimes substantially so, than for all urban households. This is important considering that preservation of the real value of the grant is most important to the poorest households, who tend to also experience the most volatility in their inflation rates. Related to this is the possible adjustment of means tests for grant eligibility, where use of the overall urban CPI may not always be appropriate. Using the overall CPI instead of a CPI for grant recipient households essentially replicates the effects of plutocratic bias. As Ley (2005, 643) notes, this "often accentuates the change in household welfare rather than smoothing it . . . [as] worse-off

households suffer under- adjustments when inflation is more harmful to them – i.e. when they can least afford it". Average inflation rates over extended periods may be relatively similar across groups, but it is the divergence at specific points in the period that may result in significant loss of welfare for poorer household groups. Similarly, adjustments affecting unskilled worker households, informal sector worker households, unemployed households and households with children would best be made using group-specific CPIs. Interestingly, it is clear that for unionised worker households there is no reason to use a group-specific inflation rate. In other words, the evidence does not support the contention that unionised worker households experience significantly different rates of inflation when compared to other households. This conclusion should, though, be tempered by the recognition that unionised worker households were defined broadly and include union members across the full occupational spectrum.

Using group-specific price indices with which to make adjustments to nominal grant values or wage minima is just one way that the government may act to shelter poor households from the effects of rising prices. Alternative policy interventions are to try to impact either the price or the weight of particular elementary aggregates. Thus, government may try to influence or control prices of items that typically impact negatively on poor households in such a way as to limit price increases. This may take the form of direct controlling of prices or through subsidisation, both of which are typically frowned upon, particularly where such interventions become long-term policies. One such instance of subsidisation in South Africa was the case of mealie meal during the 2002/2003 spike in food prices. Reducing the weight of a particular item would weaken the effect that its price would have on the household inflation rate. Such a reduction can be achieved through free provision to households. In South Africa, for example, local governments provide free basic allocations of water and electricity to poor households, effectively reducing the weights of these items within these households' expenditure baskets. Policies aimed at shifting consumption away from high-weight items, though more complex to formulate, may also help reduce the vulnerability of poorer households to inflation from those items, although the effect may be muted by correlations in price movements of substitute items.

Although it has been well established, both in the literature and in the findings in this paper, that the overall inflation rate is not necessarily representative of the inflation experiences of different groups of households, what has been rather surprising is that the extent to which individual households tend to experience rates of inflation that are substantially different from that overall rate. For the period under review, it was found that an average of only one-third of urban households experienced a rate of inflation that was within one percentage point of the all urban inflation rate, with the actual proportion ranging from barely one to fewer than six out of every ten households. Indeed, in just four out of 132 months did the proportion of households within one percentage point of the all urban inflation rate exceed 50 percent. Importantly, a negative relationship is found between the all urban inflation rate and the proportion of households within one percentage point of the all urban inflation rate: a one percentage point increase in the all urban inflation rate is associated with a 1.4 percentage points decline in the proportion of households located close to the mean inflation rate – a relationship that holds for the period as a whole, as well as during low, medium and high inflation periods.

The evidence also suggests that it is poorer households in particular that spent longer periods of time beyond one percentage point of the all urban inflation. Grant households, unskilled worker households, informal sector worker households and unemployed households typically spent the fewest months within one percentage point of the overall inflation rate. Further, a substantially higher proportion of households in

richer household groups were located within one percentage of the overall inflation rate for at least 60 out of the 132 months during the period under review. The analysis of the distribution of household-specific inflation rates reveals that the distribution is narrower for the full 132 month period than for any of the individual years, suggesting that households with above average rates of inflation in one period tend to have below average rates of inflation in other periods. Importantly, however, higher median inflation rates are associated with greater dispersion in household-specific inflation rates in line with findings by Crawford and Smith (2002, 31): an increase in median annual inflation rate of one percentage point is associated with a 1.8 percentage point increase in the annual interquartile range, while using monthly year- on-year inflation rates, a one percentage point increase in the median inflation rate is associated with a 0.15 percentage point increase in the interquartile range and a 0.6 percentage point increase in the range between the upper and lower adjacent values. This positive relationship extends to the all urban inflation rate, a one percentage point increase in which is associated with a 0.2 percentage point increase in the interquartile range.

One line of investigation that it was not possible to pursue in this paper pertains to rural households. As noted, the price indices presented in this paper covered urban households only due to the fact that the price data collected by Statistics South Africa does not cover rural areas. The behaviour of rural prices is an important area for future research, as are the purchasing habits of rural households, and is currently being explored by Statistics South Africa as part of the continual process of improving and refining the CPI methodology. Important questions to answer in terms of rural prices are the extent to which rural households may face higher prices, as well as the degree to which price movements in rural areas mirror urban price movements. Related to these is the question of the extent to which rural households make purchases from urban outlets, which one assumes would be a response to the greater variety and lower prices that characterise such outlets.

The findings presented here have implications for the analysis of poverty and inequality, particularly over time. While extensive work has been done in South Africa tracking poverty and inequality over time, differential inflation rates for different households or different groups of households are rarely considered. However, as has been found in four South American countries (Goni et al., 2006), trends in nominal and real inequality may differ if these differences are taken into account. Similarly, poverty levels and trends may be impacted by choosing alternative deflators to the urban CPI.

Overall, the evidence presented in this paper suggests that there is scope for greater application of group-specific price indices in the adjustment of nominal values of grants and wages in South Africa. While quintile inflation rates are published by Statistics South Africa, the only other published CPI that accounts for demographic or socioeconomic characteristics of house- holds is the CPI for pensioners. However, as Ley (2005, 644) notes, "the larger the income (expenditure) inequality, the more different the consumption patterns by income group, and the larger the variance in individual price behaviour, the less appealing is a single plutocratic CPI as the only policy adjuster". This is certainly true of South Africa.

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APPENDIX

A. Some Alternative Definitions of Household Groups

There are numerous ways in which to define the household groups analysed in this paper. Indeed, several definitions were considered for each household group before a particular definition was chosen.

1. Grant recipient households:

(a) At least one household member is in receipt of a social grant;
(b) At least 90 percent of regular household income is in the form of social grants; or
(c) At least one household member is in receipt of a social grant and the household receives no labour income;

2. Unskilled worker households:

(a) At least one household member is employed in an unskilled occupation (elementary or domestic work occupations);
(b) All employed household members are employed in unskilled occupations;
(c) Household head is employed in an unskilled occupation; or
(d) At least 90 percent of regular household income derives from employment in unskilled occupations;

3. Unionised worker households:

(a) At least one employed household member belongs to a trade union;
(b) All employed household members belong to a trade union;
(c) Household head is employed and belongs to a trade union; or
(d) At least 90 percent of regular household income derives from employment of trade union members;

4. Public (private) sector worker households:

(a) At least one household member employed in the formal sector is employed in the public (private) sector;
(b) All household members employed in the formal sector are employed in the public (private) sector;
(c) At least 90 percent of regular household income derives from employment in formal public (private) sector;

5. Formal (informal) sector worker households:

(a) At least one household member is employed in the (in)formal sector;
(b) All employed household members are employed in the (in)formal sector;
(c) At least 90 percent of regular household income derives from employment in the (in)formal sector;

6. Unemployed households:

(a) At least one household member is unemployed according to the narrow definition of unemployment;
(b) At least one household member is unemployed according to the expanded definition of unemployment;

(c) All economically active household members are unemployed according to the narrow definition of unemployment;

(d) All economically active household members are unemployed according to the expanded definitions of unemployment;

(e) All economically active household members are unemployed according to the narrow definition of unemployment and at least 90 percent of regular household income derives from social grants;

(f) All economically active household members are unemployed according to the expanded definition of unemployment and at least 90 percent of regular household income derives from social grants;

7. Households with children

(a) At least one household member is under the age of 18 years;
(b) At least one household member is under the age of 15 years;
(c) At least one household member is under the age of 15 years and the household receives a social grant.

B. Descriptive Statistics for Expenditure for Samples Before and After Trimming

Household Group		Obs	Weight ('000s)	Mean	Std.Dev.	Min	Max	Gini
Grants	Before	984	332	3 862	5 054	190	235 998	0.455
	After	895	295	3 174	2 017	828	10 429	0.341
Unskilled	Before	1 639	706	6 430	23 981	60	614 452	0.514
	After	1 439	629	4 807	3 046	978	13 918	0.345
Unionised	Before	2 060	903	16 905	27 926	641	614 452	0.504
	After	1 857	804	13 137	9 117	514	46 081	0.366
Private	Before	3 266	1 592	17 360	29 059	516	614 452	0.569
	After	2 957	1 417	12 616	10 558	972	52 317	0.426
Public	Before	1 366	635	17 564	17 799	383	164 778	0.466
	After	1 230	569	15 229	10 926	400	48 585	0.379
Formal	Before	5 317	2 599	18 851	27 406	383	614 452	0.541
	After	4 800	2 313	14 398	11 422	192	54 531	0.413
Informal	Before	520	257	8 082	9 949	259	77 141	0.528
	After	464	229	6 438	5 445	043	27 266	0.420
Unemployed	Before	1 846	755	3 991	4 735	27	46 807	0.470
	After	1 645	672	3 243	2 087	705	10 019	0.346
With Children	Before	1 852	663	4 115	5 009	190	50 827	0.471
	After	1 679	589	3 252	2 053	850	10 444	0.334

Source: Own calculations, IES 2000 and LFS 2000:2.

C.   Densities of the Distribution of Annual Inflation Rates, 1998-2008
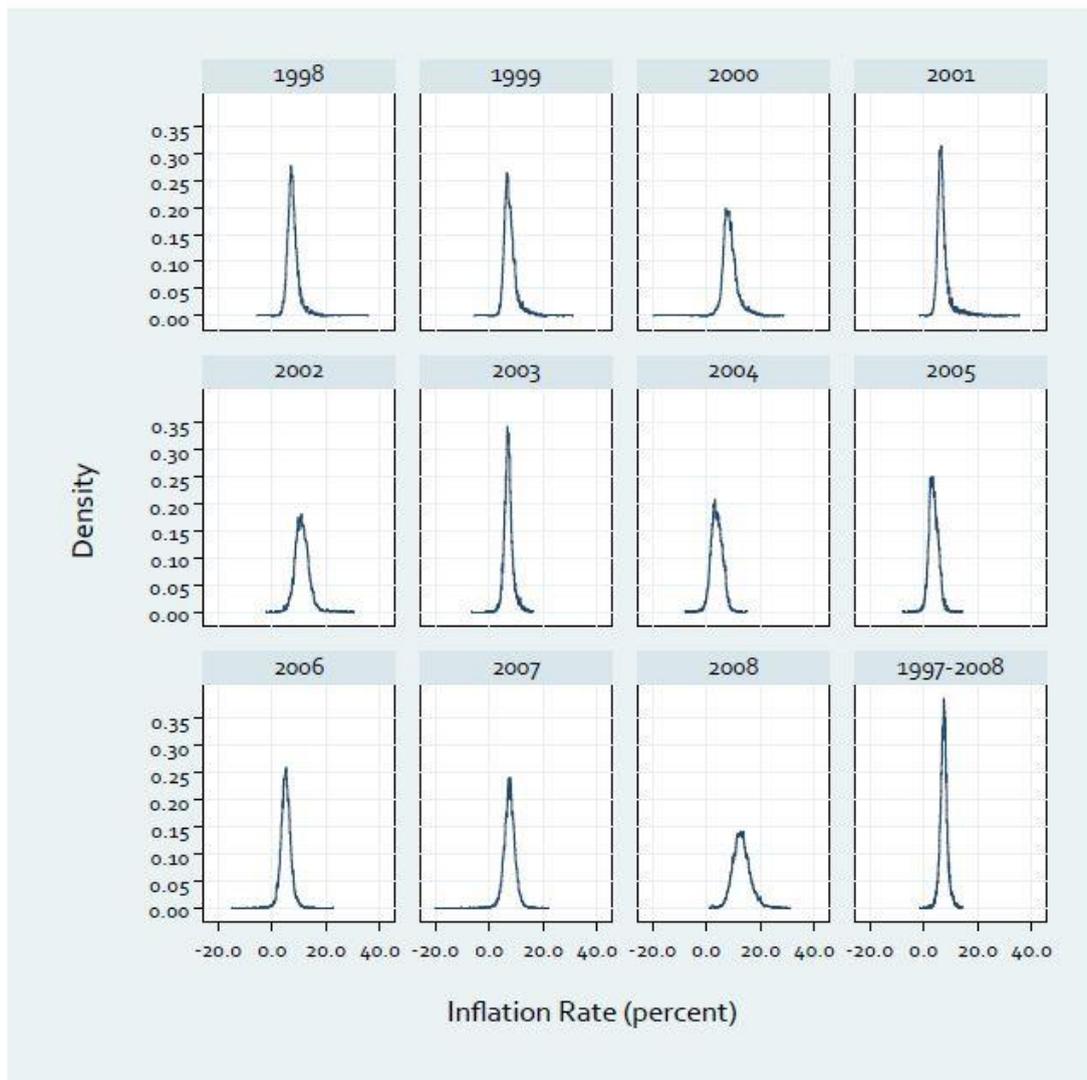
Source: Own calculations, IES 2000.

D.   Households Within One Percentage Point Range, by Household Group

Household Group	Months within 1pp Range	Proportion of Households within 1pp Range for . . .						
		0-23 Months	24-35 Months	36-47 Months	48-59 Months	60-71 Months	72+ Months	<60 Months
Grants	52	15.1	32.4	24.7	14.2	9.4	4.2	86.4
Unskilled	51	20.4	27.7	22.2	16.7	7.5	5.4	87.1
Unionised	64	16.4	15.6	17.7	17.7	13.7	18.9	67.4
Private	62	14.9	19.4	21.5	16.1	12.6	15.5	71.8
Public	65	15.9	14.6	18.3	18.3	13.6	19.2	67.2
Formal	64	14.6	17.3	20.0	16.6	13.3	18.2	68.4
Informal	56	11.8	30.3	24.5	14.8	10.4	8.1	81.4
Unemployed	50	18.9	31.8	24.9	14.2	5.9	4.4	89.7
With Children	59	12.1	25.5	23.1	17.2	12.1	10.1	77.8

Source: Own calculations, IES 2000 and LFS 2000:2.

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