Polarization in SSA's Countries : the Case of Ghana and Nigeria

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All that Glitters is not Gold : Polarization Amidst Poverty Reduction in Ghana

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Introduction

Ghana : Progress and Challenges

- Over the last two decades, several African countries experienced stable and sustained growth that did not translate, nonetheless, into rapid poverty reduction.

- Ghana is an exception compared to the rest of SSA countries : Ghana's rapid growth did translate into fast poverty reduction ; inequality increased over the last two decades (Aryeetey and Baah-Boateng, 2015; Cooke et al., 2016) but, compared to other SSA countries, Ghana still fares relatively well (Molini and Paci, 2015).

- A closer look at the distributional changes occurred in the same period suggests, however, less optimism : like many other developing countries (Clementi et al., 2014, 2015; Clementi and Schettino, 2015) Ghana is experiencing a fast increase in *polarization.*

- The notion of polarization is concerned with the disappearance of the middle class (Foster and Wolfson, 1992; Wolfson, 1994, 1997) ; it can also be regarded as the "clustering" of a population around two or more poles of the distribution, which might give rise to social conflicts and tensions (Esteban and Ray, 1999, 2008, 2011).

- Our aim is twofold :

1. We use a very intuitive yet little explored method, the "relative distribution" (Handcock and Morris, 1998, 1999), for taking into account all the distributional differences that would not be detected easily from a comparison of standard measures of inequality and polarization.
2. We develop a novel methodology to identify the different drivers of polarization and quantify their impact at different points of the welfare distribution.

Data and Methodology

The Ghanaian Household Survey Data

- We use data from the Ghana Living Standard Survey (GLSS) for 1991/92 (GLSS-3), 1998/99 (GLSS-4), 2005/06 (GLSS-5) and 2012/13 (GLSS-6).
- The GLSS is a nation-wide survey conducted by the government-run Ghana Statistical Service that has emerged as one of the most important tools for assessing the living conditions of Ghanaian households.
- It provides detailed information on approximately 200 variables, including several socio-economic and demographic characteristics, and information on household consumption of purchased and home-produced goods as well as asset ownership.
- As a measure of well-being we use household consumption per adult equivalent to capture differences in need by age and economies of scale in consumption.
- When the data are analyzed, sampling weights are used to account for the survey design.
- Besides, to enhance comparability of consumption data over the four waves, all expenditures have been deflated across both space and time and expressed in 2005 constant prices—as well as converted, when necessary, from Ghanaian second cedi (GHC) to Ghanaian third cedi (GHS), i.e. for GLSS-3 to GLSS-5.

Table 1 : Summary Measures of Ghanaian Household Total Consumption Expenditure

	1991/92	1998/99	2005/06	2012/13
Observations	4,523	5,998	8,687	16,772
Mean	459.91	568.45	736.8	883.48
Median	352.66	438.04	559.44	655.60
Consumption shares				
Bottom 5%	1.11	1.00	0.79	0.82
Bottom 10%	2.71	2.42	2.08	2.13
Bottom 20%	6.82	6.21	5.65	5.63
Top 20%	44.78	44.47	46.59	46.94
Top 10%	29.16	28.17	30.75	30.43
Top 5%	18.52	17.41	19.95	19.17
Inequality measures				
Gini	0.38	0.38	0.41*	0.41
Theil	0.25	0.25	0.30*	0.29

* Denotes statistically significant change from the previous period at the 5% level (p-value < 0.05)
Source : authors' own calculation using GLSS data sets

Besides the growth of the real mean and median consumption expenditures, the most notable feature is the picture that emerges across different indicators of inequality. The consumption shares of the poorest percentiles of the population decreased between approximately 0.9 and 1.4% a year in the period examined, in contrast to what is observed for the richest percentiles, whose shares experienced average yearly increases of around 0.2%. Inequality in household consumption was initially constant, but widened considerably between 1998/99 and 2005/06—a jump of about 7% in the Gini's coefficient and 20% in the Theil's index. Inequality has remained constant at the higher level after 2005/06, but the trends in the shares of consumption of the bottom and top quintiles have continued in the same direction.

Table 2 : Inter-Quantile Consumption Ratios by GLSS Wave

Wave	p10/p50	p25/p50	p75/p25	p75/p50	p90/p10	p90/p50
1991/92	0.46	0.66	2.37	1.56	5.23	2.42
1998/99	0.41	0.63	2.60	1.64	6.00	2.48
2005/06	0.39	0.61	2.63	1.62	6.36	2.46
2012/13	0.39	0.62	2.68	1.66	6.73	2.65

Source : authors' own calculation using GLSS data sets

The results of a simple inter-quantile analysis show that the ratio of average consumption among the top 10 of the distribution to the average consumption among the bottom 10 had risen considerably even before 1998/99, suggesting that the more well-off benefited more than the poorest decile from the economic growth in 1991–98. Over the years, the consumption levels of the top and the bottom of the distribution continued to diverge at a steady rate so that the gap expanded by 30% over the full period. The divergence was widening because the bottom 10 was being left behind, rather than because the top 10 was gaining disproportionally compared with the rest of the population. The average consumption of the 90th percentile rose little relative to the median, while the average consumption of the bottom 10 deteriorated by nearly 20% by 2005/06. The bottom 10 appears to be losing ground also compared with other households in the bottom 25, who are also losing ground to the median but only half as quickly.

Decomposition of Location and Shape Differences

- In the original relative distribution framework, the method proposed to measure the impact of of covariates on the observed distributional changes does not provide intuitive results and it is of limited use for policy making purposes.

- By contrast, our method, using recent developments from the regression-based decomposition literature, allows to quantify the impact of an arbitrary number of covariates on distributional differences due to both location and shape shifts, so as to identify the key drivers of these changes.

- In detail, we proceed along the following steps :

   1. We first run *unconditional quantile regressions* (Firpo et al., 2009) to estimate the impact of changing the distribution of explanatory variables on each decile of the reference and comparison distributions.

   2. Then, the total difference in household consumption at the same decile of the comparison and reference distributions is decomposed—in a spirit similar to the standard decomposition of mean differentials (Blinder, 1973; Oaxaca, 1973)—into one part that is due to differences in observable characteristics (*endowments*) of the households, one part that is due to differences in returns (*coefficients*) to these characteristics, and a third part that is due to *interaction* between endowments and coefficients.

- Hence, the "declining middle class" scenario would suggest that *negative* differentials are to be decomposed for deciles below the median, whereas for those above the median the total differences should be *positive*.

Results

Changes in Ghanaian Consumption Distribution
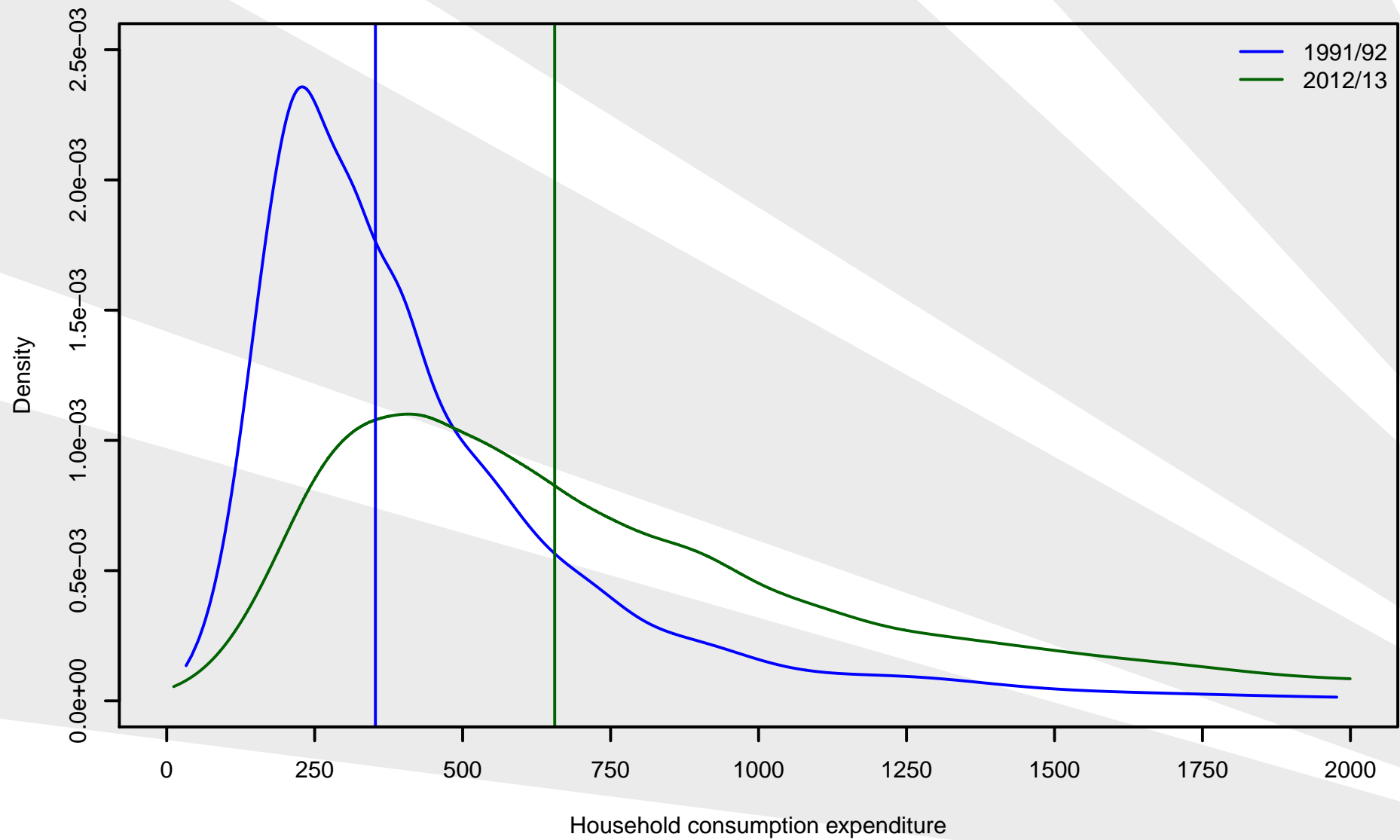
- The reference or 1991/92 distribution has a slight right skewness, while the comparison (2012/13) distribution has a larger median and variance.

- The relative distribution offers the immediate impression that the proportion of households in the upper deciles increased dramatically throughout the two decades, while the proportion in the bottom and around the middle declined.

- Since the median shift was quite large, this alone would have virtually eliminated the households in the first four deciles of the 1991/92 consumption distribution and placed a considerable fraction of them in the top end of the 2012/13 distribution.

- Once changes in real median expenditure are netted out, a U-shaped relative density is observed, indicating that polarization was hollowing out the middle of Ghanaian household consumption.

- The fraction of households at both the top and bottom tails of the Ghanaian consumption distribution increased consistently over the course of the last two decades, while the fraction in the middle declined.

- The relative polarization indices capture these changes well :

  — the overall index (MRP) rises continuously and the rise is statistically significant from the outset ;
  — decomposing the MRP into the contributions from the lower and upper tails of the distribution, it also appears that "downgrading" dominated "upgrading" in the polarization upswing—the value of the LRP is indeed always greater than that of the URP.

Figure 1 : Kernel Distributions, 1991/92 and 2012/13

Changes in Ghanaian Consumption Distribution
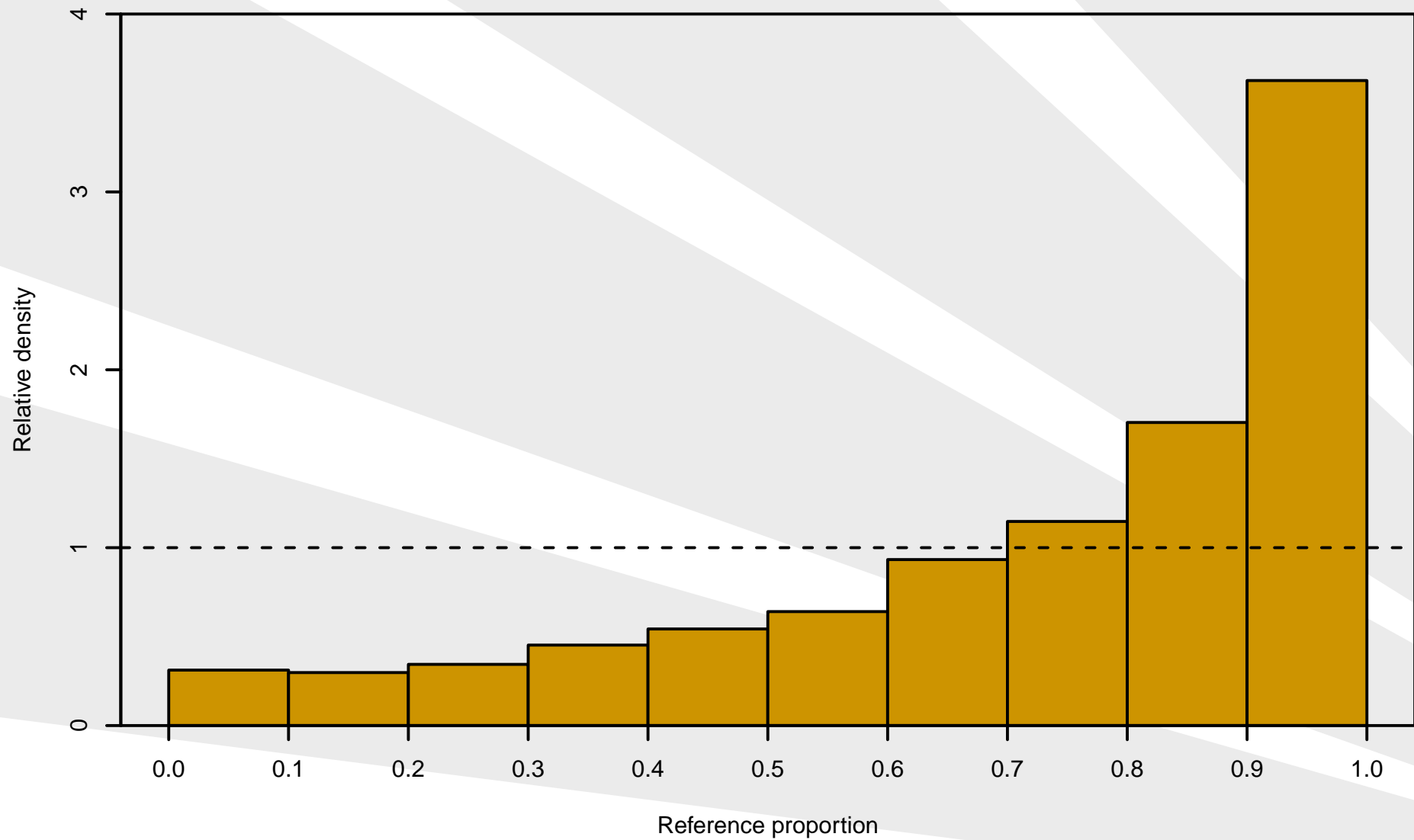
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Figure 2 : Relative Consumption Distribution, 2012/13 to 1991/92

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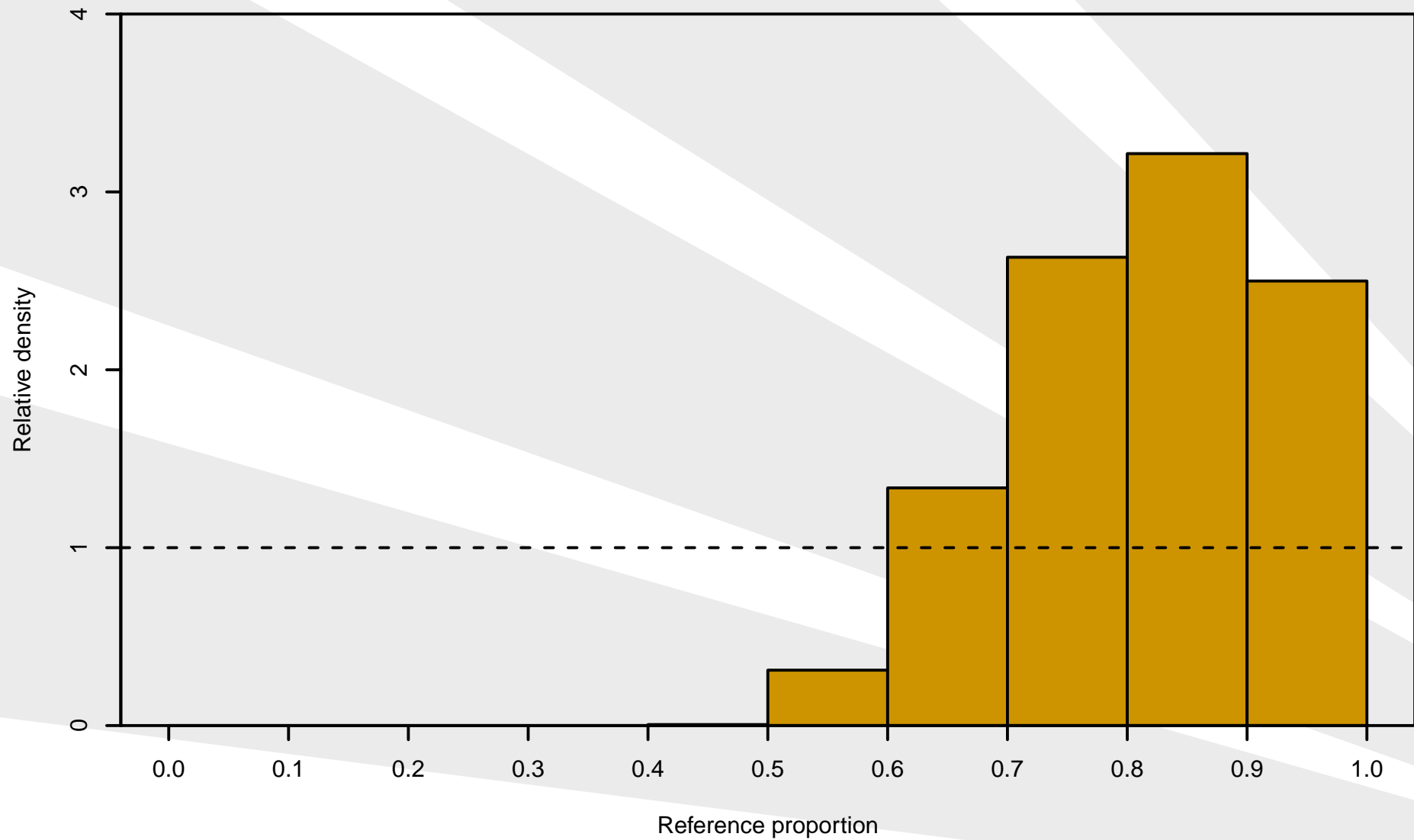
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Figure 3 : Location Effect, 2012/13 to 1991/92

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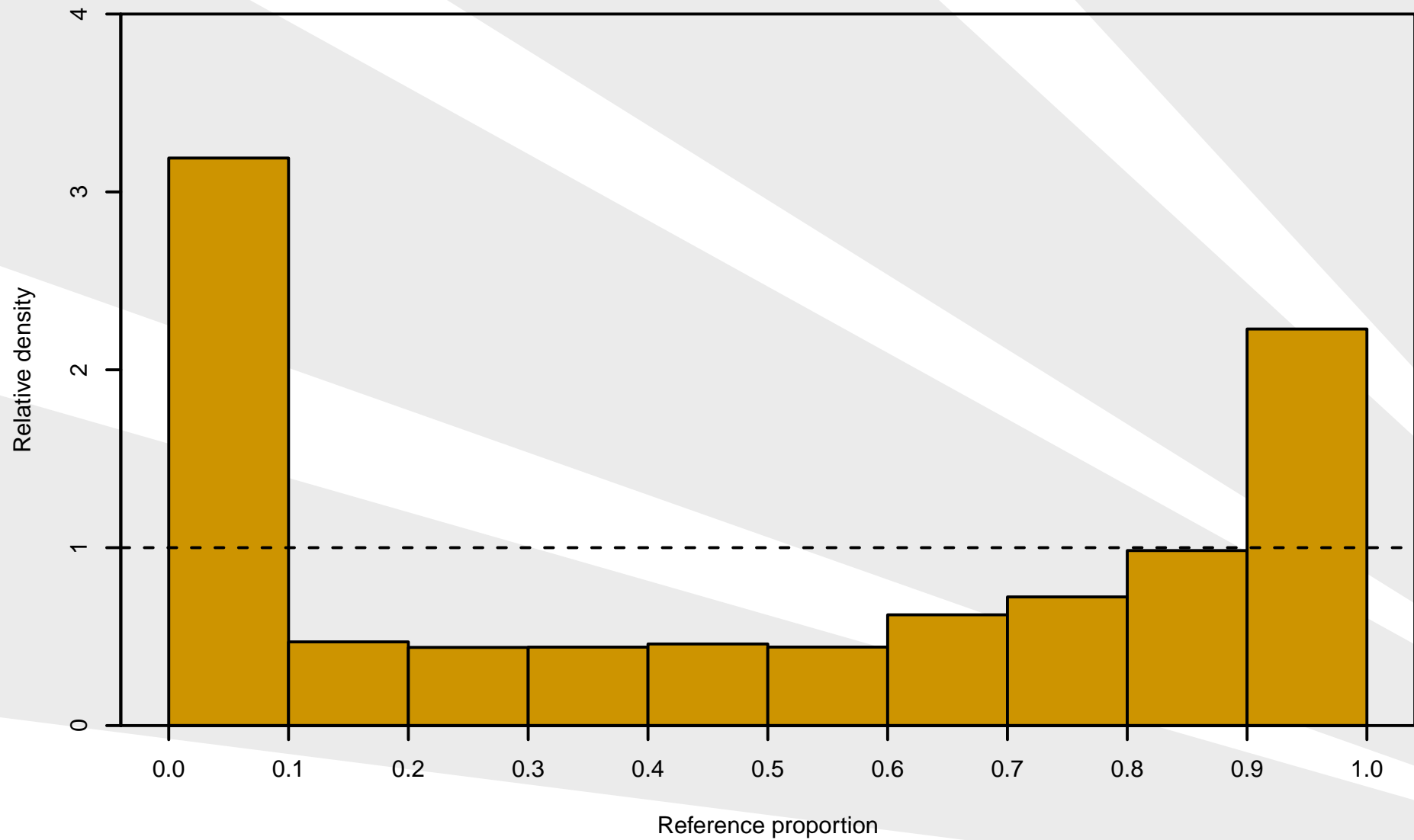
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Figure 4 : Shape Effect, 2012/13 to 1991/92

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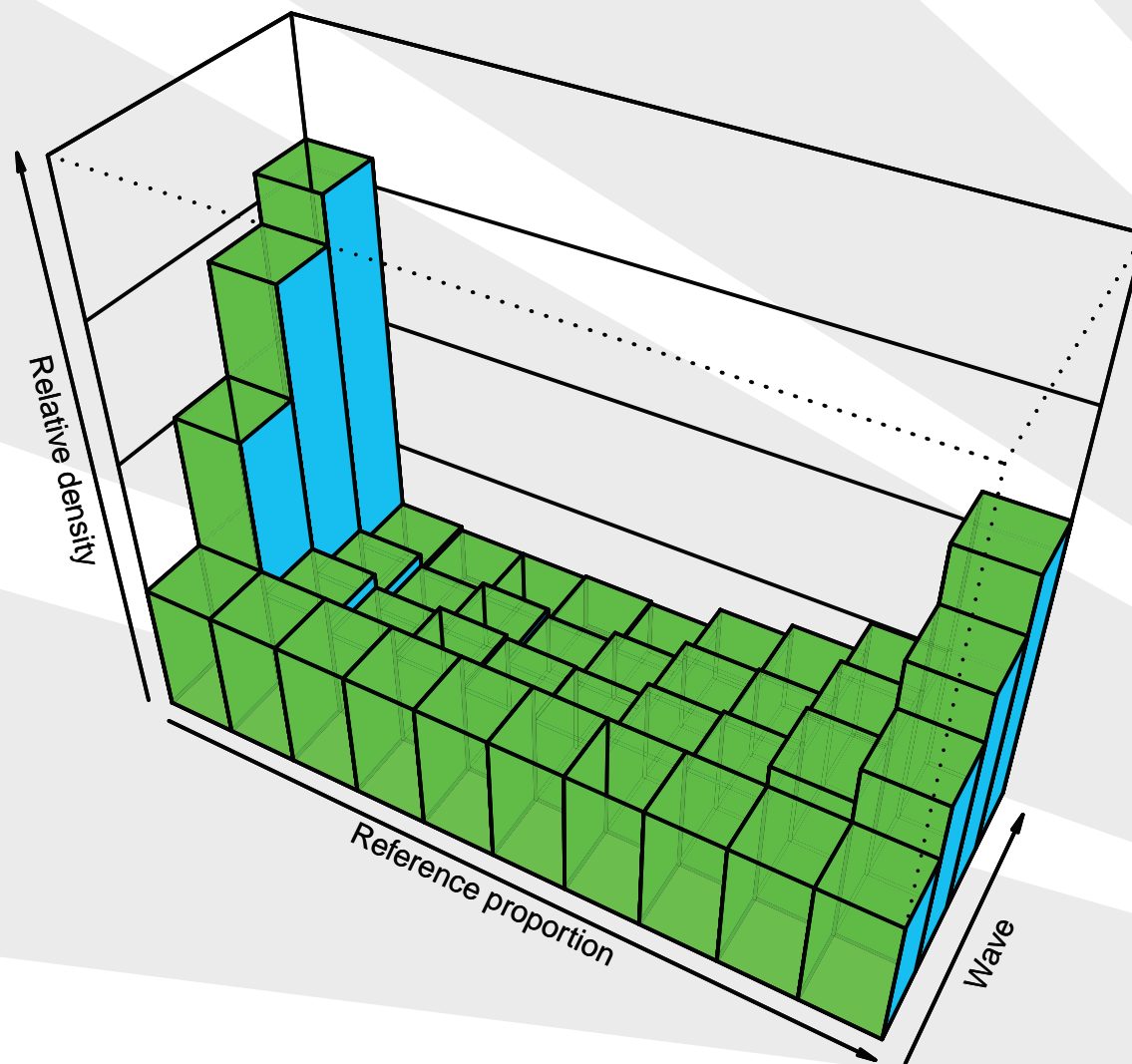
- The reference or 1991/92 distribution has a slight right skewness, while the comparison (2012/13) distribution has a larger median and variance.
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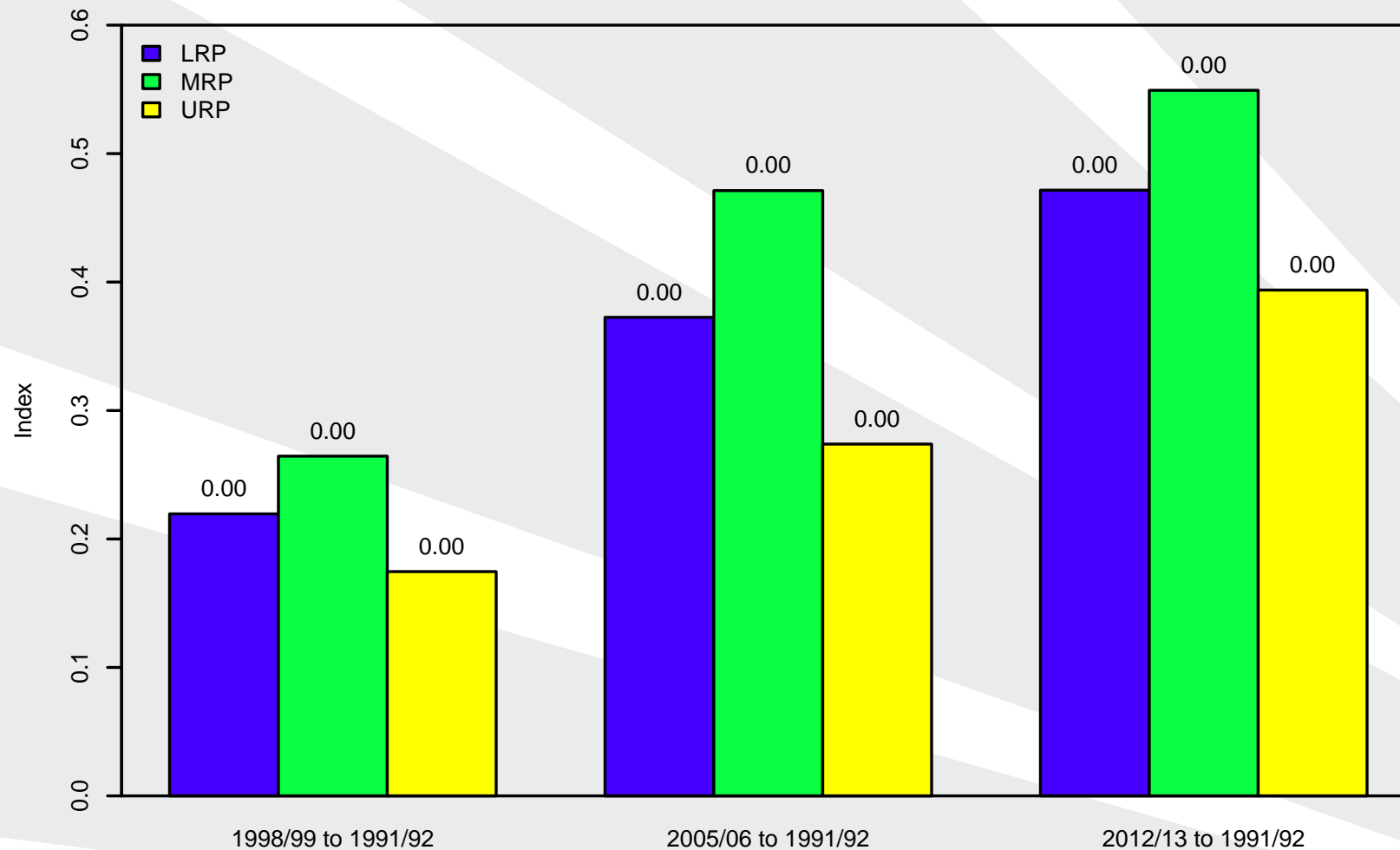
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Figure 6 : Relative Polarization Indices by Wave

Note : the number above each bar indicates the *p*-value for the null hypothesis that the index equals 0

Temporal Decomposition

- To get a more compact picture of the timing and nature of the polarization trend, we break the 21-year period into 3 sub-periods : 1991–98, 1998–2005, and 2005–12.

- The per-period specific relative distributions clearly point to the median up-shift in household consumption expenditure as the dominant trend for each sub-period.

- The strongest effects due to the median shift were in the bottom deciles, confirming that more low-consuming households joined the ranks of those whose consumption levels put them in the top half of the reference distributions.

- However, once changes in location are netted out, there is also an indication of growing polarization as the median-adjusted relative distributions take an approximate U-shape.

- The polarizing trend seems nearly symmetric for the years 2005 to 2012, while throughout the 1990s and up to the mid 2000s the growth in the lower tail of the distribution was noticeably stronger than in the upper tail.

- The relative polarization indices are consistent with the visual impression from the shape shifts.

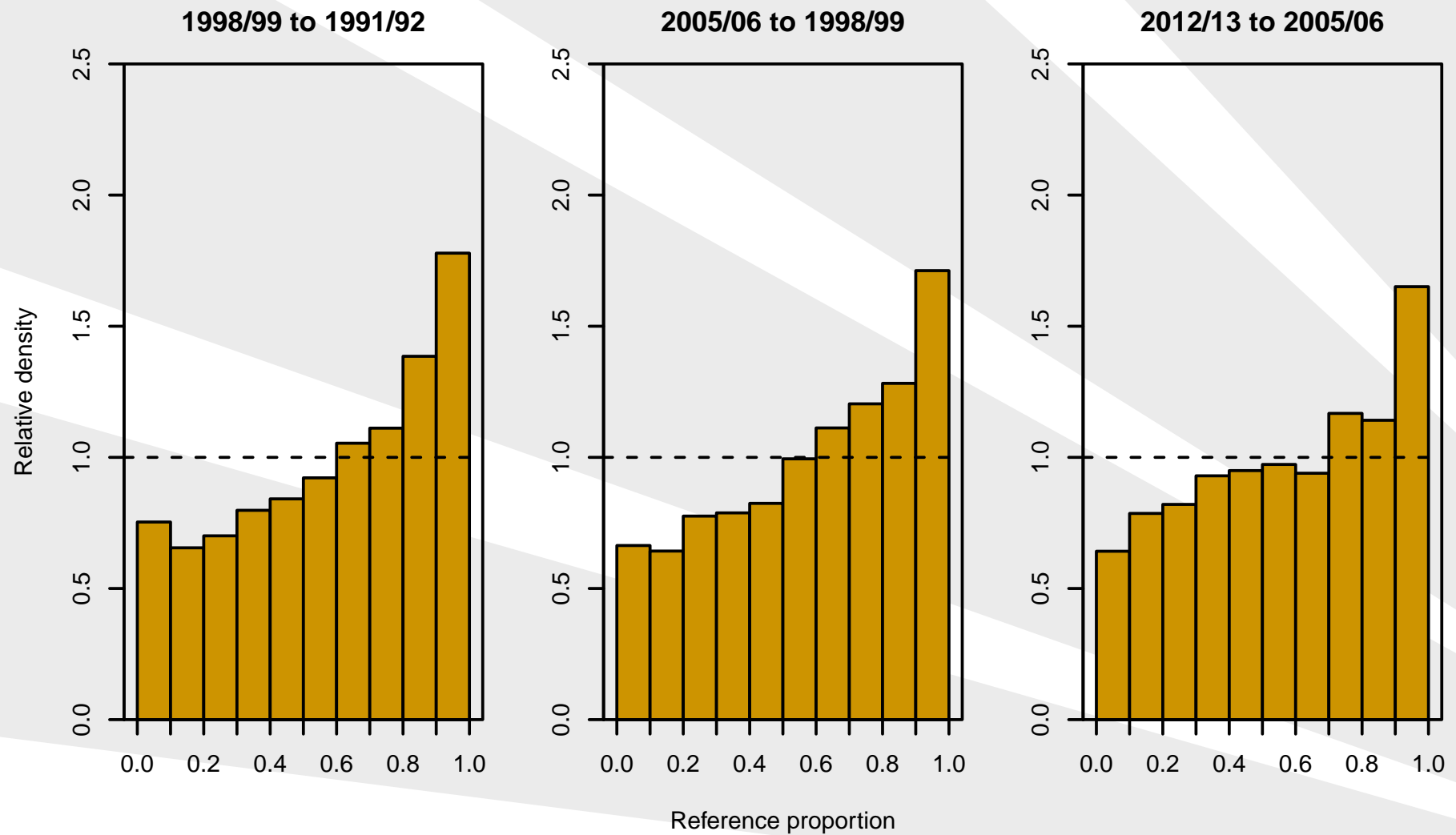# Figure 7 : Relative Consumption Distribution for Ghana by Sub-Period

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Figure 8 : Location Effect by Sub-Period

Temporal Decomposition
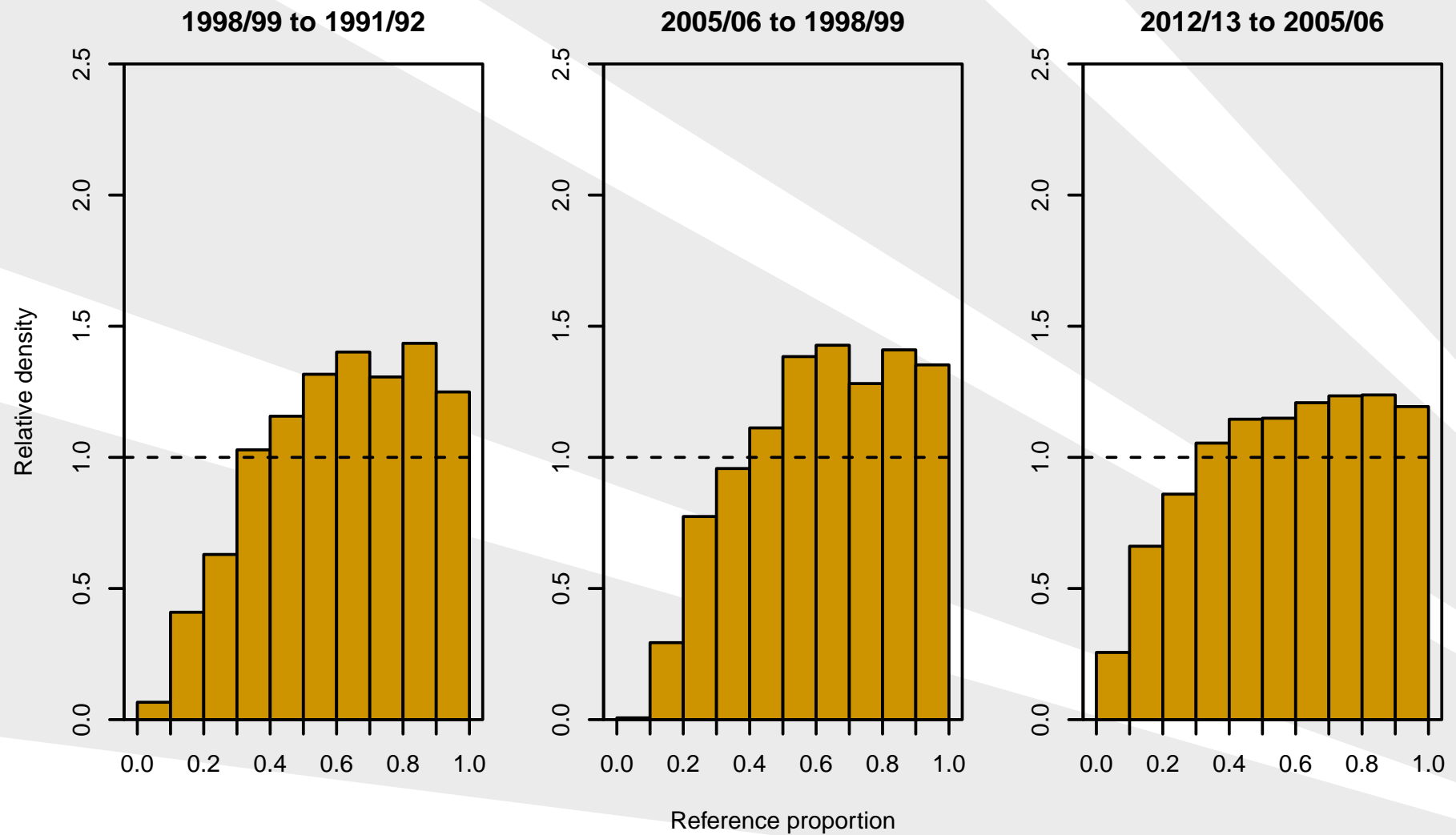
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Figure 9 : Shape Effect by Sub-Period

Temporal Decomposition
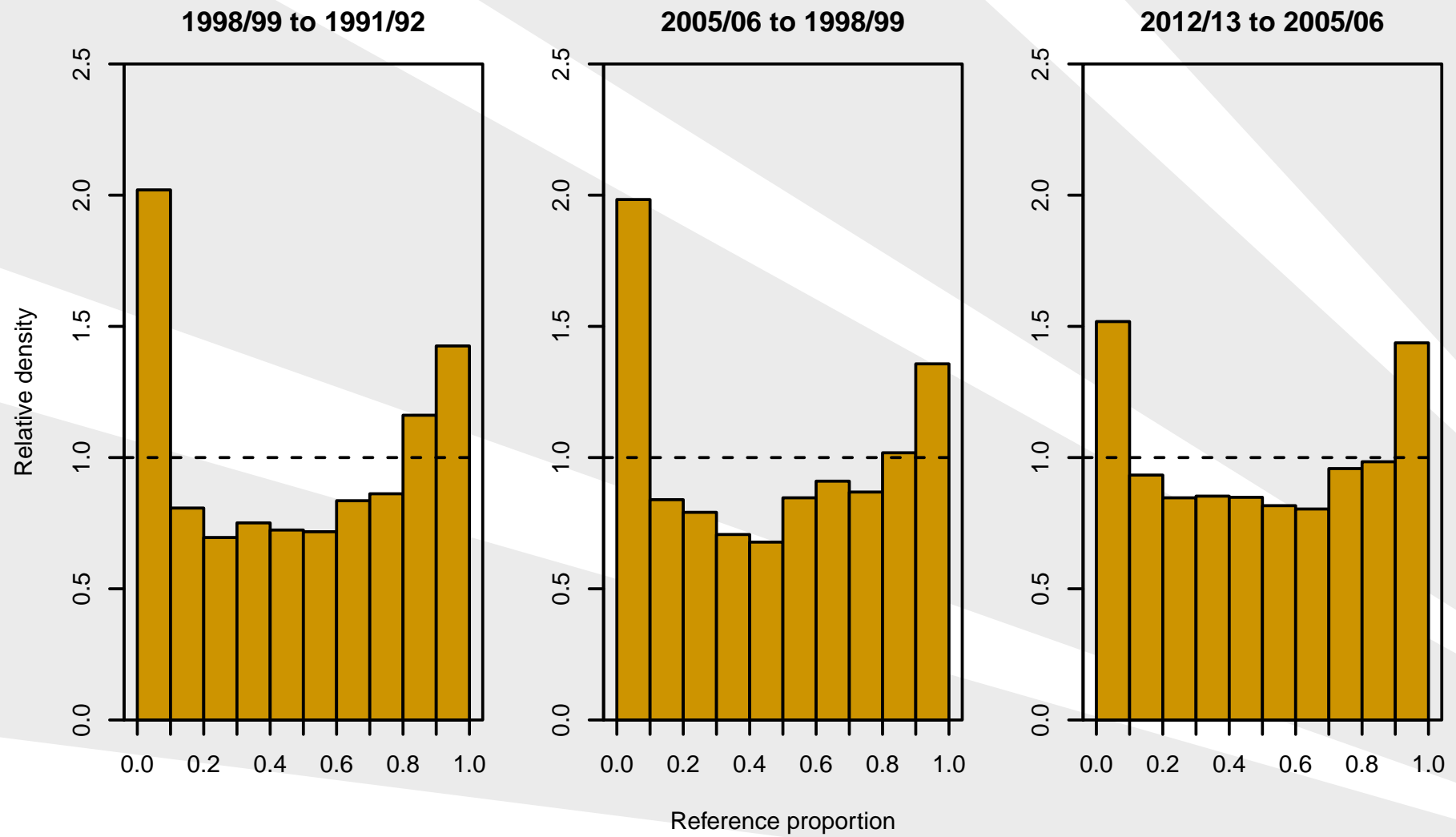
- To get a more compact picture of the timing and nature of the polarization trend, we break the 21-year period into 3 sub-periods : 1991–98, 1998–2005, and 2005–12.

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- The relative polarization indices are consistent with the visual impression from the shape shifts.

Table 3 : Relative Polarization Indices by Sub-Period, 1991/92 to 2012/13

	Index	p-value
1998/99 to 1991/92		
MRP	0.22	0.00
LRP	0.26	0.00
URP	0.17	0.00
2005/06 to 1998/99		
MRP	0.19	0.00
LRP	0.27	0.00
URP	0.11	0.00
2012/13 to 2005/06		
MRP	0.14	0.00
LRP	0.14	0.00
URP	0.14	0.00

Source : authors' own calculation using GLSS data sets

The MRP index is always positive and statistically significant (*p*-value $= 0.00$). Decomposing the MRP into the contributions to distributional change made by the segments of the distribution above and below the median, it appears that "downgrading" dominated "upgrading" in the polarization upswing over the course of the first two sub-periods—the value of the LRP index is indeed greater than that of the URP. The values of the indices in the 2005–12 period denote instead a nearly perfectly symmetric polarization in each tail.

The Drivers of Growing Polarization

- We summarize the evidence for the three main sub-periods.

- **1991–98**

  — Household composition and basic infrastructures increased lower polarization, while location effects and education tended to partly offset their impact.
  — The location/urban variable, education and basic infrastructures determine an increase in upper polarization.

- **1998–2005**

  — Household characteristics, education and basic infrastructures all tended to have pro-polarization outcomes.
  — Top deciles were particularly benefiting from the demographic dividend stemming from smaller families and lower dependency ratios.
  — The location/urban variable countered this increase, due to the cocoa boom and the relatively good performance of many rural areas (Molini and Paci, 2015).

- **2005–12**

  — Urban and regional variables drive polarization.
  — In addition, basic infrastructures, employment variables and education had a strong impact on upper polarization.
  — As for 1998–2005, the variations in household composition benefit the top percentiles and contribute significantly to the increase of polarization.

Conclusions

Summary

- Ghana offers the opportunity to analyze the last two decades' distributional changes, since four comparable household surveys are available.
- The country presents interesting specificities : since 1991, poverty has declined very fast, inequality has not increased dramatically and yet the country has seen a rapid surge in polarization.
- The results of our analysis suggest that the distributional changes hollowed out the middle of the Ghanaian household consumption distribution and increased the concentration of households around the highest and lowest deciles.
- Results on drivers of polarization indicate that although there is some heterogeneity across the various sub-periods, in particular in terms of magnitude, household characteristics, educational attainment and access to basic infrastructures all tended to increase over time the size of the upper and lower tails of the consumption distribution and, as a consequence, the degree of polarization.
- Urban/rural and regional variables started to have a strong impact on polarization only in the last decade : households residing in Greater Accra and the urban areas of Ashanti region performed well and increased their relative economic advantage over the rest of the country.

Policy Implications

- From a policy perspective, the pro-polarization impact of variables that tend to change slowly over time is of particular concern.

- It is very unlikely that policy makers can find a quick fix to the problem, and any intervention will produce results only in the long run.

- This implies that the country needs to start now to develop a strategy that, if not able to immediately reverse polarization, at least can mitigate its impact.

- The creation of a modern social protection system, the expansion in the access to basic services, the continued effort to expand primary and secondary education are all interventions that can pay off and help the country to maintain its social cohesion.

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≪ There's a lady who's sure/All that glitters is gold/And she's buying a stairway to heaven ≫

[Led Zeppelin, "Stairway to Heaven", *Led Zeppelin IV*, 1971]

Thank you all !

The Center Cannot Hold: Patterns of Polarization in Nigeria

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Overview

INTRODUCTION

Nigeria: The GIP Trilogy and Beyond

- Recent analysis on consumption patterns in Nigeria (e.g. World Bank, 2013) seems to suggest an increase in "I"-nequality that could have offset the benefits from sustained "G"-rowth in terms of "P"-overty reduction.

- Inequality increase is, however, just one aspect of the whole problem; our hypothesis is that Nigeria is also going through a process of economic *polarization*.

- Broadly speaking, the notion of polarization is concerned with the disappearance of the middle class (e.g. Foster and Wolfson, 1992, and Wolfson, 1994, 1997); it can also be regarded as the "clustering" of a population around two or more poles of the income/consumption distribution, which might give rise to social conflicts and tensions (Esteban and Ray, 1999, 2008, 2011).

- Nigeria represents an interesting case for undertaking a polarization analysis: GDP per capita has steadily grown in the last decade and Nigeria is likely to become the biggest African economy, but yet clear signs of consolidation of a national middle class are limited; moreover, the country is increasingly affected by sub-regional conflicts.

Aim of the Work

- Studies on polarization in Nigeria are still few (e.g. Araar, 2008, Awoyemi and Araar, 2009, and Awoyemi et al., 2010) and the limited availability of comparable data series not too close in time has hindered an investigation of the long-run patterns – the process of polarization is indeed generally slow and significant changes can be detected only over long periods.

- The present study is innovative under at least three aspects:

  1) unlike previous studies, rather than just computing and comparing polarization indices, we apply a non-parametric tool (the "relative distribution") to explore polarization along the entire distribution;

  2) since the relative distribution analysis requires at least two comparable survey rounds, we use "survey-to-survey" imputation techniques to produce fully comparable distributions; in this way we overcome the lack of comparable surveys that limited the scope of previous work.

  3) since Nigeria is highly heterogeneous across macro regions, we also aim at documenting sub-national patterns of polarization; the flexibility of the relative distribution approach allows indeed an accurate analysis at the macro-regional level too.

DATA AND METHODOLOGY

The Need for Comparable Data

- Excluding cases of sudden shocks, measures such as inequality, poverty or polarization tend to move slowly in time; comparison of such measures, computed on surveys relatively distant in time, captures therefore more accurately the effects of structural modifications in the distribution of a welfare variable.

- Comparisons over a long time span, however, can be made difficult – if not impossible – by changes in data collection methodology (Tarozzi, 2007).

- In particular, there is increasing evidence that questionnaires revisions can affect respondents' answer in relevant ways (e.g. Deaton and Grosh, 2000).

- Other changes such as the switch from a diary-based collection to a recall-based collection can dramatically alter aggregate food consumption expenditures, a relevant component of total expenditures in many developing countries (e.g. Beegle et al., 2010, and Ahmed et al., 2014).

- For our specific case, since we adopt a methodology based on comparison of two distributions, it becomes crucial using distributions sufficiently distant in time in order to see significant differences; the need for comparable data requires thus to be directly addressed.
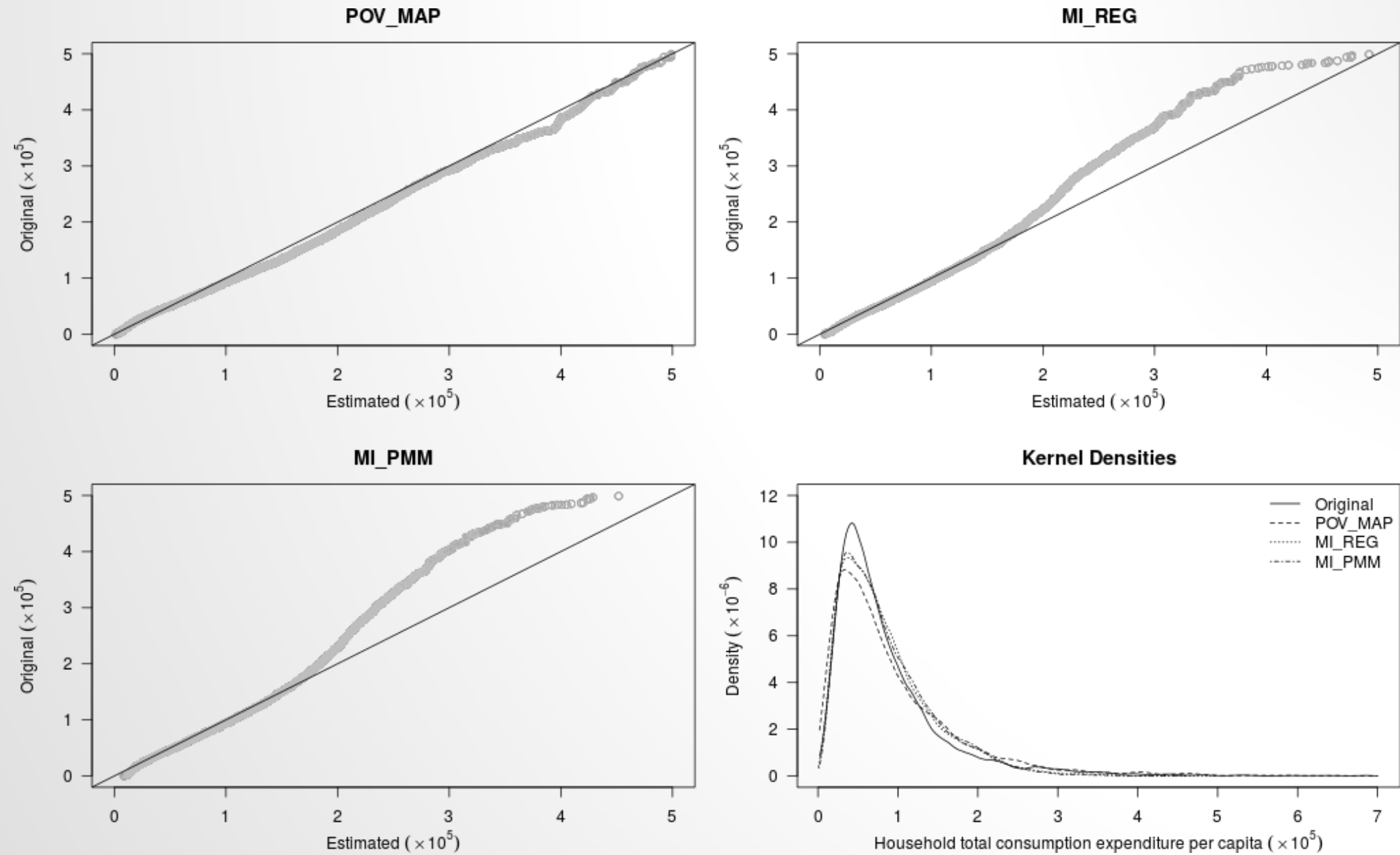
The Nigerian Household Consumption Data

- The Nigeria's National Bureau of Statistics (NBS) has generally used the National Living Standard Survey (NLSS) 2003/2004 and the Harmonized National Living Standard Survey (HNLSS) 2009/2010 to monitor progress in poverty reduction over the last decade.

- The NBS also conducts other household surveys, most notably the General Household Survey (GHS) cross section and panel.

- The GHS cross section is a survey of 22,000 households carried out periodically throughout the country; data on consumption are collected by asking the household about broad categories of consumed items in the last month: food, healthcare, school, and so forth; available datasets include 6 rounds, from 2004/2005 to 2010/2011.

- The GHS panel is a randomly selected sub-sample from GHS cross section consisting of 5,000 households and covering the periods 2010/2011 (Wave 1) and 2012/2013 (Wave 2); it is representative at national and zonal (geo-political) levels; in every panel wave, households are interviewed two times: once in the "post-planting" period (from August to November) and once in the "post-harvesting" period (from February to April).

Enabling Data Comparison for Nigeria

- Nigerian consumption data from the three previously mentioned household surveys are not directly comparable; preliminary checks for poverty and inequality levels computed on the GHS panel and the HNLSS, for example, indicate that the figures derived using the former look substantially different from those computed on the latter.

- To enable data comparison over a long time span (a decade), we employ "survey-to-survey" imputation techniques (Elbers et al., 2003).

- Specifically, we first estimate a model of log per capita consumption expenditures on the Wave 1 of GHS panel data by including several household variables on demographic characteristics, durables and location as explanatories; we use then the estimated coefficients to predict consumption on the 2003/2004 NLSS survey.

- The validity of the model has been tested by means of both in-sample criteria (i.e. by evaluating the R^2 size = 0.63) and out-of-sample criteria (i.e. by testing its ability to simulate the consumption distribution of GHS panel Wave 2, where household consumption and non-consumption data are available reliably) against two alternative imputation methods (Figure 1).

Figure 1 Post-Imputation Diagnostic Plots

RESULTS

Changes in Nigerian Consumption Distribution

- An insight on the key changes occurring in the distribution of total per capita consumption expenditure of Nigerian households is provided by Table 1.

Table 1 Summary Measures for Nigerian Household Consumption Expenditure Per Capita

	2003/2004	2012/2013
Mean	64,424	93,597
Median	49,563	64,846
Standard deviation	60,565	201,536
Skewness	7.11	53.15
Kurtosis	142.57	4,853.21
Consumption shares		
Bottom 5%	0.80	0.77
Bottom 10%	2.09	2.00
Bottom 20%	5.61	5.33
Top 20%	45.82	50.52
Top 10%	29.65	35.44
Top 5%	18.76	24.77
Inequality measures		
Gini	0.40	0.45
Theil	0.29	0.46
Polarization measures[a]		
Foster-Wolfson	0.36	0.37
Duclos-Esteban-Ray	0.24	0.26

[a] The Duclos-Esteban-Ray index has been computed with the polarization sensitivity parameter a set at 0.5

Changes in Nigerian Consumption Distribution

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- The relative distribution analysis reveals an overall upshift of the distribution that partly obscures a tendency to polarization (Figure 2).

Figure 2 Changes in the Nigerian Consumption Distribution over 2003-2013
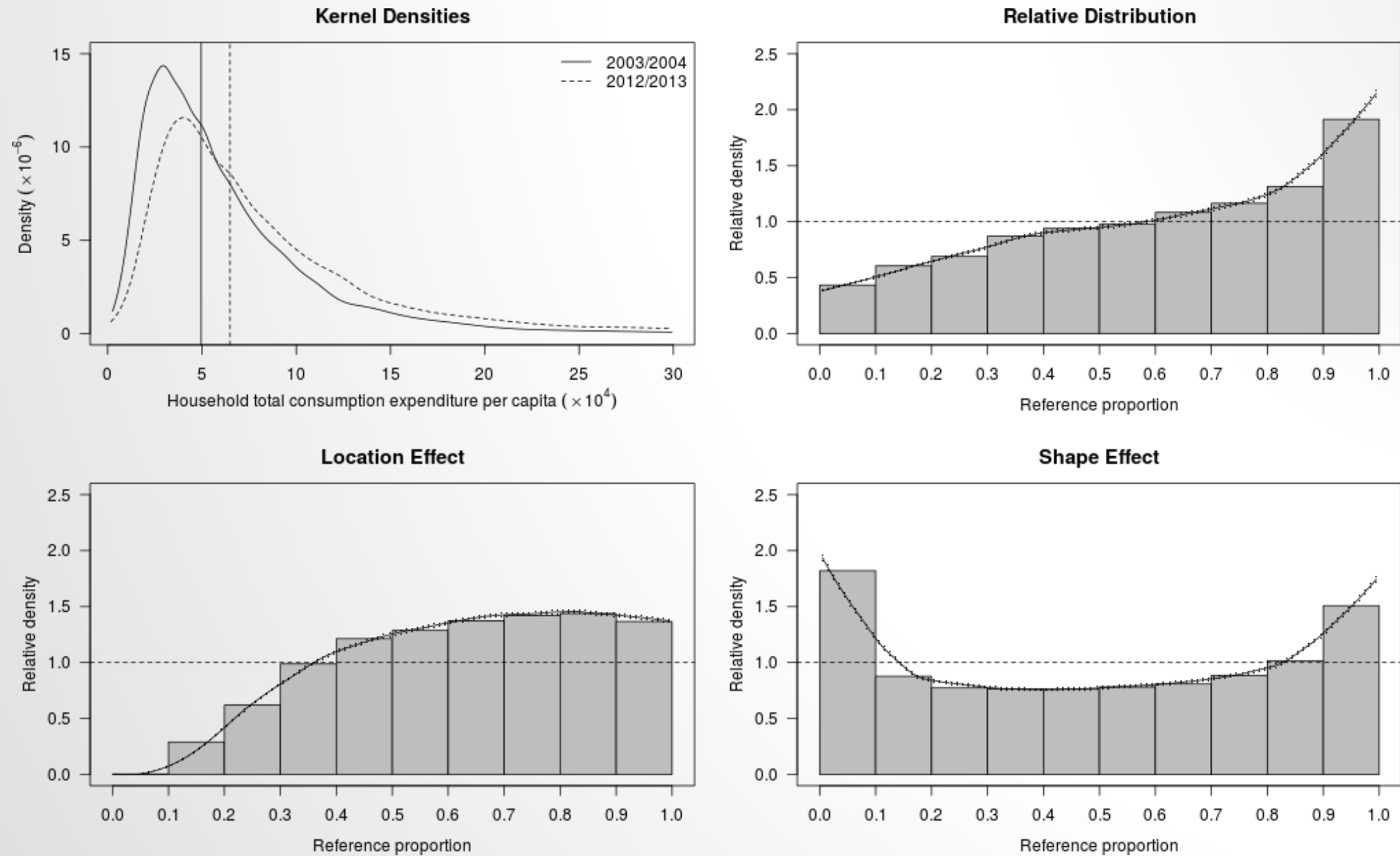
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- The size and sign of the estimated relative polarization indices confirm the impression left by the graphical display (Table 2).

Table 2 Relative Polarization Indices, 2012/2013 to 2003/2004

Index[a]	Value	LB[b]	UB[c]	*p*-value[d]
MRP	0.18	0.16	0.19	0.00
LRP	0.21	0.18	0.24	0.00
URP	0.15	0.12	0.18	0.00

[a] MRP = median relative polarization index; LRP = lower relative polarization index; URP = upper relative polarization index
[b] Lower bound of the 95 percent confidence interval
[c] Upper bound of the 95 percent confidence interval
[d] Refers to the null hypothesis of no change with respect to the reference distribution, i.e. that the index equals 0

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- This pattern of distributional polarization, however, is not entirely homogeneous within the country, but varies from zone to zone (Figure 3).

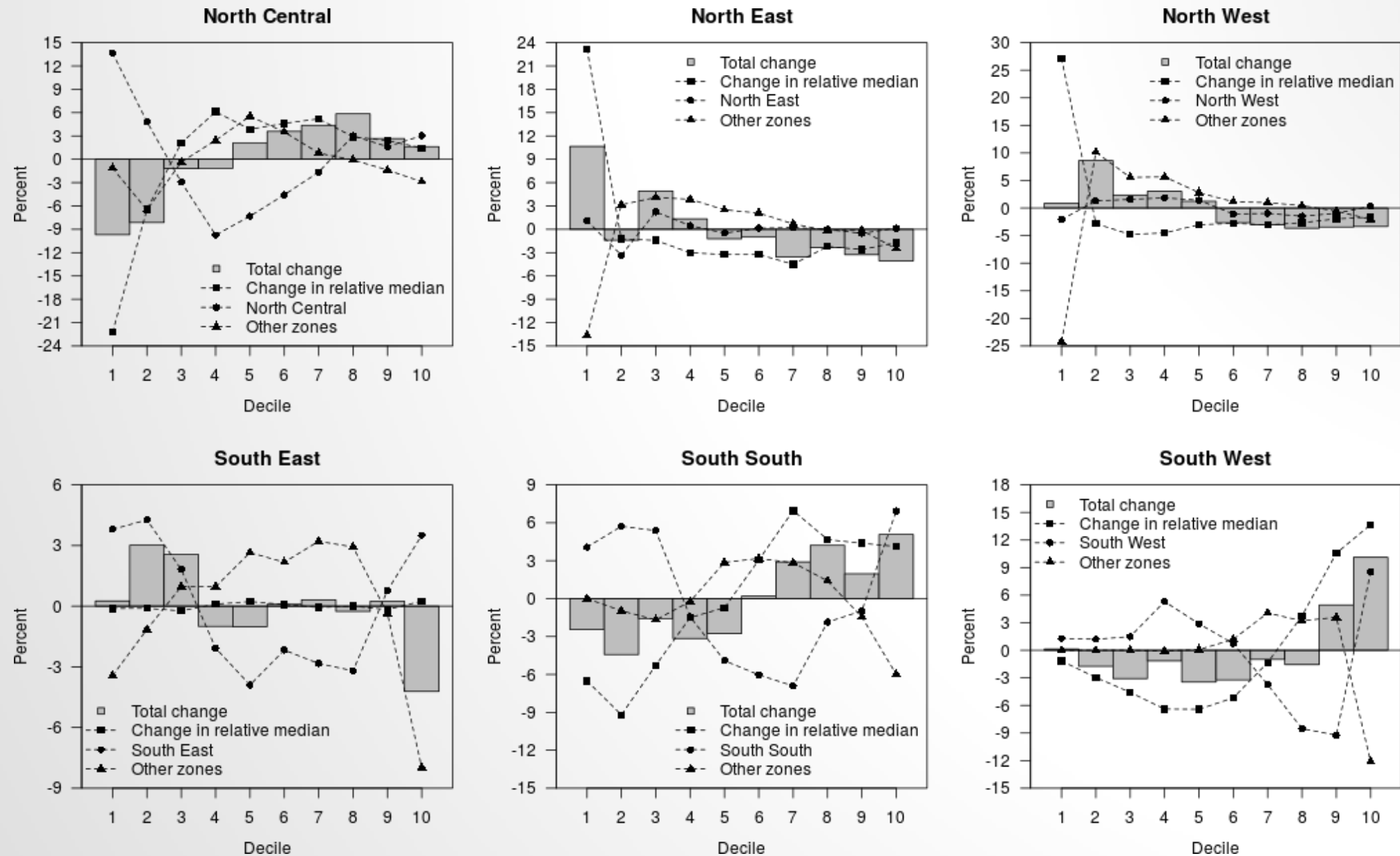**Figure 3** Relative Polarization Indices by Zone, 2012/2013 to 2003/2004
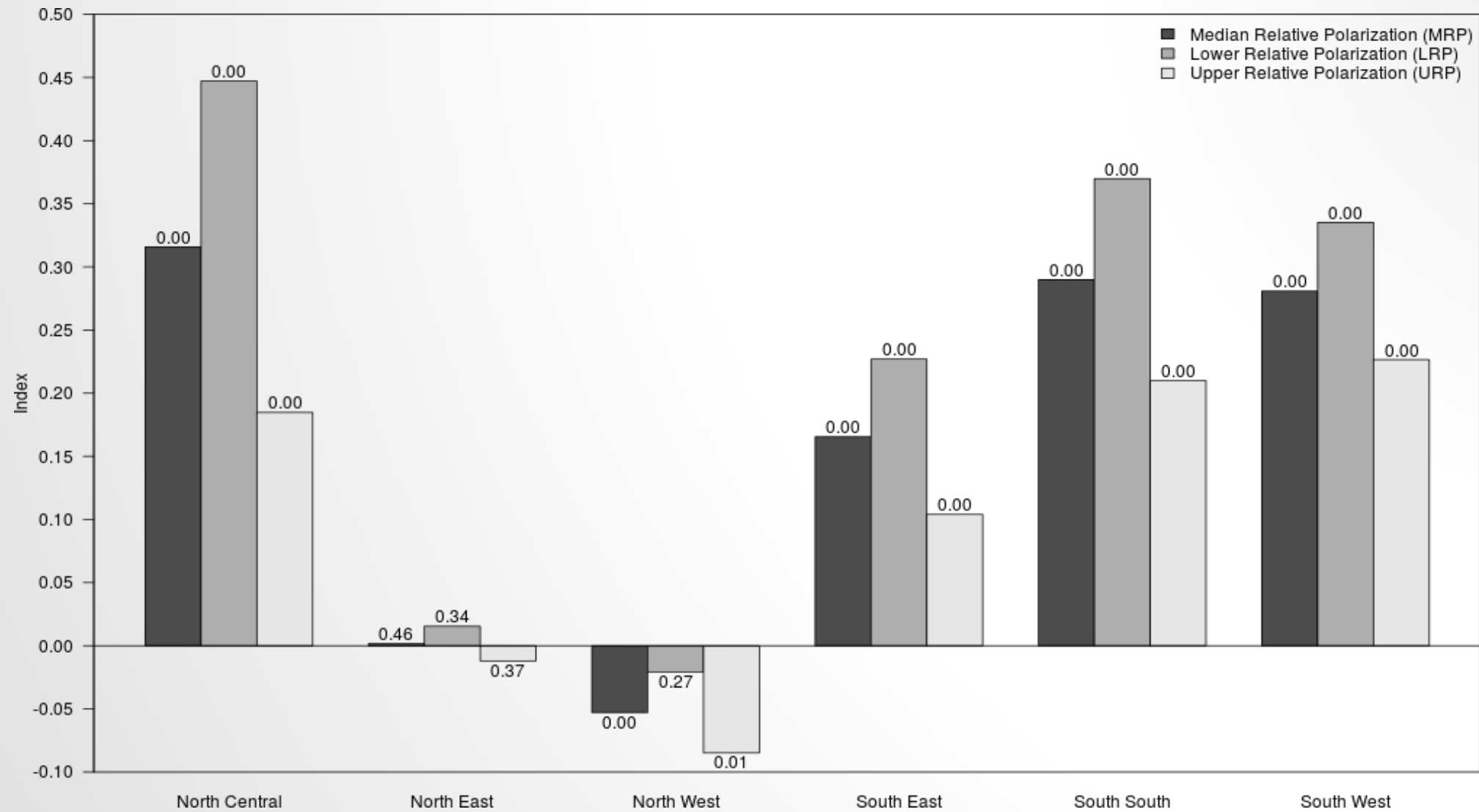
Note The number above or below each bar indicates the *p*-value for the null hypothesis that the index equals 0

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- When controlling for spatial characteristics of household head, a clear macro-regional gap seems to emerge: in fact, while the South South and South West regions contribute mainly to polarization in the upper tail of the national consumption distribution, households in the North East and North West zones – the conflict-stricken areas – are more likely to fall in the lower national deciles compared to the rest of the country (Figure 4).

Figure 4 Sources of Distributional Change by Zone, 2003-2013

Changes in Nigerian Consumption Distribution

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- Results for the other covariates (demographic characteristics and durables ownership) look instead as expected.

Concluding Remarks

- Nigeria experienced a stable and sustained growth over the last decade, but despite this the outcomes in terms of poverty reduction have not been satisfactory, probably due to fast increases of inequality.

- Inequality, however, represents just one aspect of the whole problem: the country, we argue, is also undergoing through a process of polarization.

- By undertaking an analysis that is innovative from different points of view, we were indeed able to detect a clear rise in polarization, meaning that the distributional changes observed between 2003/2004 and 2012/2013 hollowed out the middle of the Nigerian household consumption distribution and increased concentration of the mass toward the tails.

- These modifications describe in particular a situation where Northern households increasingly moved from the center toward the bottom of the distribution, while Southern households increasingly moved upward; the overall impact was a generalized hollowing out of the middle and a further accentuation of the North-South divide characterizing the country.

- An obvious side effect of our analysis is the tendency of the Nigerian society to be more conflict-prone; our future research will be therefore directed in understanding how existing conflicts in Nigeria can be interpreted and linked to the patterns of polarization.

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«Things fall apart; the centre cannot hold»
[C. Achebe. *Things Fall Apart*. William Heinemann Ltd., London,1958]

THANK YOU ALL!