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Poverty-Specific Purchasing Power Parities in Africa

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Abstract

The paper revisits the issue of poverty-specific purchasing power parities (PPPs), using the most recent (2011) International Comparison Program (ICP) results. The World Bank's global poverty count uses a common international poverty line—currently $1.90 at 2011 international prices—based on the ICP PPPs for consumption. The use of these PPPs is often criticized for two reasons. First, the ICP PPPs are based on patterns of aggregate household consumption, not the consumption of the poor. Second, the basket of goods and services used for collecting prices for the ICP is not poverty specific. On the first issue, using data from 28 African countries, the paper concludes that the poverty-specific PPPs estimated with household expenditure survey weights are very similar to the ICP PPPs. On the second issue, poverty-specific PPPs were estimated after removing items deemed to be irrelevant for the poor. The overall effect of removing these items from consumption PPPs is shown to be negligible.

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Poverty-Specific Purchasing Power Parities in Africa‡

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1. *Introduction*

For its $1.90-a-day global poverty estimates, the World Bank uses an International Poverty Line (IPL) anchored to the 2011 purchasing power parities (PPPs) for household consumption expenditure from the International Comparison Program (ICP). The World Bank's practice of using ICP PPPs for household consumption expenditure to set its IPL, and convert it to local currencies, dates back nearly two decades and has not been without its critics.[1] The question often asked is how the IPL would change if these ICP PPPs were more poverty specific.

Critiques of using PPPs for household consumption expenditure ("consumption PPPs") to set the IPL often note that these PPPs are constructed using patterns of aggregate household consumption, not the consumption of the poor. In addition, it is often stressed that the basket of consumer goods and services used for ICP price surveys—and thus, underlying ICP consumption PPPs—is not poverty specific. At the heart of such critiques lies the presumption that consumption PPPs would generally be more appropriate for poverty analysis if the ICP accounted for these two aspects.

In this paper, we examine the relevance of this presumption by constructing new consumption PPPs for Africa that take account of the above-mentioned critiques. We refer to these PPPs as poverty-specific PPPs and produce two varieties, both based on the 2011 ICP PPPs. The first are consumption PPPs recomputed with poverty-specific weights, drawing from Deaton and Dupriez (2011). The second are consumption PPPs recomputed without the items deemed outside the consumption patterns of the poor—for example, extra virgin olive oil, which the ICP priced in Africa.

We report two main findings, both pertaining to Africa but easily extended to other regions. First, we find that consumption PPPs estimated with poverty-specific weights are similar to 2011 ICP consumption PPPs. This corroborates the findings by Deaton and Dupriez (2011) who reached the same conclusion using 2005 ICP consumption PPPs from Africa and other regions. Second, we find that the overall effect of removing non-poverty items from consumption PPPs was negligible.

2. *Concepts and Preliminaries*

2.1 ICP and PPPs

The ICP is a worldwide statistical initiative to collect comparative price data and compile detailed expenditure data of the world's economies. The program's main outputs are PPPs of countries' gross domestic product (GDP) and its main expenditure components.[2] ICP price data are collected via specially designed price surveys, while expenditure values in local currency are compiled from countries' national accounts.

The latest ICP comparison to date is the 2011 ICP, which took place six years after the 2005 ICP. In this sense, ICP comparisons have historically occurred at infrequent time intervals, though this will change starting with the forthcoming 2017 ICP and onwards.[3]

ICP comparisons are made from the expenditure side of the national accounts. PPPs are therefore calculated for different expenditure levels of aggregation, starting with basic headings and up to GDP. To maintain consistency with expenditures on GDP, ICP items underlying PPPs at each expenditure level were selected with the idea of approximating the full range of goods and services making up each expenditure level.

The different expenditure levels for which PPPs are calculated are illustrated by Figure 1. The second row from the bottom refers to the basic heading level, which is the building block for the ICP exercise. It

[1] Before 2001 the World Bank set its two previous IPLs using ICP PPPs for gross domestic product.

[2] Here and throughout the rest of the paper we use the term "economy" interchangeably with "country" to refer to territories for which authorities report separate statistics.

[3] At its 47th Session (March 2016), the United Nations Statistical Commission (UNSC) agreed that the ICP should be conducted more frequently, with shorter intervals between successive rounds. For more details, see United Nations Statistical Commission (2016).

is at this level that the expenditure shares used are defined and estimated, items are selected for pricing, prices are collected and validated, and PPPs are first estimated and averaged.

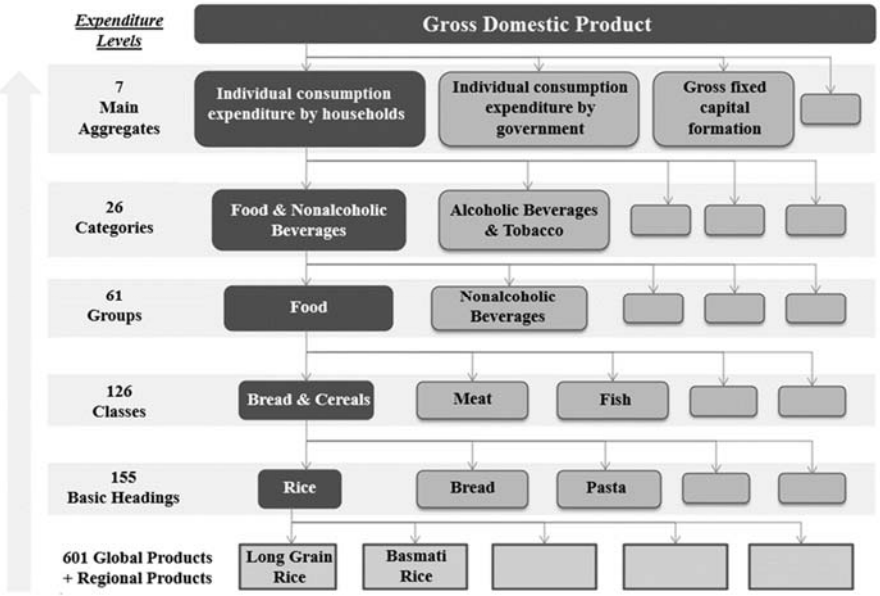

FIGURE 1. HIERARCHICAL APPROACH TO THE 2011 ICP

Against this background, it is worth expanding on the topic of how PPPs are estimated. The process, at least broadly speaking, involves two stages. At the first stage, price relatives for individual items are averaged to obtain basic heading level PPPs using the Country Product Dummy (CPD), first formulated by Summers (1973).[4] The Country Product Dummy (CPD) method is carried out within each basic heading by regressing the logarithm of observed country item prices on item and country dummies. In actual computations, the CPD formulation with weights (CPD-W) is used.[5] However, the version of the CPD-W used in the ICP incorporates information on the relative importance of items in a country's consumption rather than actual weights: weights of 3 and 1 are assigned to *important* and *less important* items, respectively.[6]

At the second stage, basic heading PPPs are aggregated using the GEKS-Fisher method to produce above-basic heading PPPs. The method uses the Fisher ideal index to construct bilateral PPPs for each pair of countries, using basic heading expenditure weights from each country in turn. The bilateral PPPs are then averaged using the Gini-Éltető-Köves-Szulc (GEKS) approach to arrive at a final vector of above-basic headings PPPs, containing one PPP for each country relative to the numeraire country. For more details on the PPP estimation process and other ICP concepts and methods, see World Bank (2015).

2.2 Poverty and PPPs

Because of the need to adjust for price differences between countries, ICP PPPs have largely been of interest to researchers working on global poverty, including those at the World Bank. The World Bank's interest in ICP PPPs gained notoriety in 1990 when it used the 1985 ICP PPPs for GDP to set its *dollar-a-day* IPL. Ever since, the use of ICP PPPs in revisions to the World Bank IPL has generated significant

[4] For a more detailed description of the method see, for example, World Bank (2015), Chapter 23.

[5] The Eurostat-OECD and CIS regions used the Jevons Gini-Éltető-Köves-Szulc* (Jevons-GEKS*) method rather than the CPD to estimate basic heading PPPs.

[6] The decision on whether an item is *important* or *less important* is taken at the country level once the ICP price collection is complete. The procedure is not entirely precise so some subjective judgement is involved.

commentary, which in turn has prompted research on the role of PPPs in methods to measure global poverty.

Deaton and Dupriez (2011) were one of the first to study the effect of estimating global poverty using poverty-specific PPPs. Using 2005 ICP data, they found that consumption PPPs reweighted to a poverty basis are quite similar to the regular 2005 ICP consumption PPPs that use weights from national accounts. They note that weighting differences are probably not of great importance for estimating global poverty counts. To reach this conclusion, they used household expenditure surveys from 62 poor countries around the world to reweight the 2005 ICP consumption PPPs and produce a set of poverty-weighted PPPs. These PPPs were then used to calculate new IPLs and global poverty counts according to various definitions.

Similar research at the regional level was conducted by the Asian Development Bank (ADB). The Asian Development Bank (2008) used price data for 16 Asian countries to compile a set of poverty-specific PPPs. To that end, a separate price collection, using modified items from the 2005 ICP, was organized in 2006. The study examined whether data collected on prices for the items that were considered typical of the consumption patterns of the poor would produce significantly different poverty PPPs. This research concluded that indeed PPPs could change more substantially when using items consumed by the poor and poverty-specific weights; however, it is difficult to compare its results directly to the 2005 ICP because of differences in methodology, timing and geographical scope (number of countries). In particular, because of inclusion of more items with loose specifications, comparability of items across countries could be more problematic in the ADB's study than in the 2005 ICP.

3. *Source Data*

3.1 ICP and CPI data

Throughout, we make extensive use of 2011 ICP data, classifications and concepts. Our interest though is on PPPs for consumption, so we only work with basic headings belonging to the consumption component of GDP.

In section 4 we focus on the reweighted consumption PPPs. The reweighting process was done at the basic heading level and we worked with 108 of the 110 basic headings for household consumption. Our calculations exclude two basic headings that are outside the scope of most household expenditure surveys, namely those corresponding to expenditures in the domestic market by non-resident households and expenditures of resident households when traveling abroad.

In addition to ICP data, computations in section 4 also required data on consumer price indexes (CPIs) of individual countries.[7] CPIs for general consumption were used to deflate the local currency value of the IPL to prices prevalent in the year each household expenditure survey was conducted. This was necessary when calculating poverty-specific PPPs that required identifying households below or around the IPL. All CPI series used were sourced from ICP regional implementing agencies, the IMF Statistics Department, and, to a lesser extent, the World Bank World Development Indicators (WDI).

In Section 5 we turn to the item level. Computations in this section relied on item-level price data and related metadata from the 2011 ICP Africa exercise, which included 50 countries. Unlike in section 4, we used information from all 110 basic headings for household consumption when possible, even if the two basic headings excluded in section 4 contain no item-level information.

3.2 Standardized household expenditure survey data

Our reweighting of consumption PPPs required switching regular ICP national accounts sourced expenditures with those from household expenditure surveys. In particular, we used expenditures from a set of standardized data sets derived from existing household expenditure survey data files. Table 1 lists the survey title and year of the household expenditure surveys underlying each of the 28 standardized data

[7] CPIs measure the average change over time in the prices of consumer goods and services purchased for consumption by a reference population.

sets used. In addition, it provides information on the number of survey items and ICP basic headings in each standardized file.

While we aimed to cover and reweight PPPs for all countries in Sub-Saharan Africa, we were limited to the 28 countries with available standardized data sets at the time of our study.[8]

TABLE 1 — HOUSEHOLD EXPENDITURE SURVEYS BY YEAR, ITEMS AND ICP BASIC HEADINGS, 28 COUNTRIES

Country	Survey title	Year	Items	ICP basic headings
Burkina Faso	Enquête Burkinabé sur les Conditions de vie des Ménages	2013	237	83
Burundi	Questionnaire des Indicateurs de Base du Bien-Etre	2006	85	41
Cameroon	Enquête Camerounaise auprès des Ménages III	2007	942	105
Cabo Verde	Questionário Unificado de Indicadores Básicos de Bem-Estar	2007	265	92
Congo, Dem. Rep.	Enquête 1-2-3 sur l'emploi,le secteur informel et les conditions de vie	2005	710	101
Congo, Rep.	Questionnaire des Indicateurs de Base du Bien-être	2005	768	106
Côte d'Ivoire	Enquête Niveau de vie des Ménages	2008	195	62
Ethiopia	Household Consumption and Expenditure Survey	2010	1,153	98
Gabon	Enquête Gabonaise pour l'Evaluation et le suivi de la Pauvreté	2005	317	94
Ghana	Ghana Living Standards Survey VI	2012	527	98
Guinea	Enquête Légère pour l'Evaluation de la Pauvreté	2007	418	79
Kenya	Kenya Integrated Household Budget Survey	2005	508	91
Liberia	Household Income and Expenditure Survey	2014	228	79
Madagascar	Enquête Permanente Auprès des Ménages	2005	261	67
Malawi	Third Integrated Household Survey	2010	220	69
Mali	Enquête Légère Intégrée auprès des Ménages	2006	228	90
Mozambique	Inquérito aos Agregados Familiares	2008	918	103
Namibia	Household Income Expenditure Survey	2009	30	4
Niger	Enquête Nationale sur le Budget et la Consommation des Ménages	2007	386	87
Nigeria	General Household Survey, Panel, Wave 2	2012	227	70
Rwanda	Enquete Intégrale sur les Conditions de Vie de Menage	2010	388	90
Senegal	Enquete de Suivi de la Pauvrete	2005	69	38
South Africa	Income and Expenditure Survey	2010	775	102
Swaziland	Household Income and Expenditure Survey	2009	482	86
Tanzania	Household Budget Survey	2011	547	89
Togo	Questionnaire des Indicateurs de Base du Bien-être	2006	256	87
Uganda	National Household Survey	2010	168	69
Zambia	Living Conditions Monitoring Survey V	2010	265	79

We must underline that the feasibility of much of our results in section 4 is reliant on these standardized data sets. In this sense, it is useful to have some understanding of the standardization process and its output.

The standardization process provides household expenditure survey data in a more accessible and manageable format—a considerable feat considering the lack of harmonization of household expenditure surveys across countries. The process utilizes a common data dictionary (i.e., common variable names, formats, and data structures) to extract consumption expenditure data from household expenditure surveys. The process involves three main steps that we summarize as follows: (i) mapping survey items to ICP basic headings, (ii) annualizing consumption values; and (iii) identifying and fixing outliers.

The first of these steps involves mapping survey items from each household expenditure survey to one of the 110 ICP 2011 consumption basic headings. This ensures some correspondence between the survey data and the ICP.[9] The second step is required because household expenditure surveys collect data using

[8] Standardized household expenditure surveys were originally prepared for Deaton and Dupriez (2011) and are part of the World Bank's Global Consumption Database (GCD). For more information on the GCD, visit: http://datatopics.worldbank.org/consumption/

[9] Mapping survey items to ICP basic headings would be more straightforward if survey questionnaires grouped items according to the Classification of Individual Consumption According to Purpose (COICOP) classification, which corresponds largely to the ICP classification of final expenditures on GDP. This is rarely the case, so the mapping is generally a time-consuming manual process.

recall periods that vary depending on the type of goods and services. Finally, the third step focuses on detecting and fixing top outliers in consumption values to further ensure the reliability of the survey data. For more details on the standardization process, see Dupriez (2007).

4. *Poverty-specific PPPs: Reweighting of consumption patterns*

4.1 Method and approach

The usage of national accounts instead of poverty relevant weights in calculating consumption PPPs is a typical critique of the IPL used for global poverty measurements. However, as mentioned earlier, this was not a problem as found by Deaton and Dupriez (2011) using 2005 ICP data.

In revisiting this topic, we follow up on Deaton and Dupriez (2011) and calculate poverty-reweighted PPPs using 2011 ICP data. The reweighting procedure involves substituting the conventional national accounts-based basic heading expenditure weights with poverty-relevant weights from household expenditure surveys. Implicit in this process is the requirement to identify poor households consistently across countries, which in turn leads to a well-recognized circularity issue: PPPs determine the IPL below which the poor live, whose expenditure weights in turn affect the PPPs. We solve this issue using an iterative procedure to arrive at a final set of poverty-weighted PPPs. The procedure can be described as follows: the **n***th* iteration would involve estimating a new set of PPPs— $\mathbf{PPP}_{n}$—with some previous set of poverty weights $\mathbf{w}_{n-1}$ and then use $\mathbf{PPP}_{n}$ to estimate a new set of poverty weights $\mathbf{w}_{n}$ to be used in the next iteration $n+1$.

In this context, we estimated a variety of poverty-weighted PPPs using different methods to identify poor housing across household expenditures surveys. In particular, we used the uniform and bi-weight kernels to obtain the consumption patterns from households around the IPL. We then derived average basic heading level expenditure weights using a *democratic* method.[10] As a control, we also ran the computation for poverty-weighted PPPs using expenditures from households below the IPL and averaged the basic heading weights using a *plutocratic* method.

In discussing the poverty-weighted PPPs based on iterative procedures, the issue of uniqueness of the solution deserves special attention. Deaton and Dupriez (2011) note that there is no guarantee that a unique solution exists in the general case. They report that uniqueness is guaranteed though for log-linear budget shares and the Törnqvist index.

However, it seems that uniqueness is also guaranteed in the general monotonic case for budget shares, not only log-linear, and even for a non-monotonic relationship without sharp oscillations. In practice, given actual data, there seems to be no problem with convergence to a unique solution, or, at least, cases of multiple solutions have not been discovered.

4.2 Convergence speed of iterations and kernels

In general, the convergence to a unique solution was found to be extremely fast, but it did depend on the type of filter (i.e., kernel) and the bandwidth (bw) employed. On the latter, we explore three different bandwidths for each of the two kernel shapes.[11]

Understandably, the uniform kernel is less stable as it is affected by weight irregularities and distribution lumpiness at both ends of the band, whereas for the bi-weight kernel the discrepancies at the ends have almost no effect on the result. As the uniform kernel is actually a band with no re-weighting,

[10] Plutocratic weights are the kind obtained from the national accounts, whereby all households are treated as one unit. Weights using this method are derived from the total expenditures of all households on a given basic heading, so richer households exert a greater influence on the computation. Democratic weights represent all households equally and are derived by taking the average of the expenditure shares of each household on a given basic heading, so all households exert an equal influence on the computation.

[11] Kernel bandwidths used are from widest to most narrow: 1.0, 0.5, and 0.25. A wider bandwidth increases the width of the shape around the IPL so that more households are included in the sample when extracting expenditures from a household expenditure survey.

using this kernel as a comparator would show the effect of re-weighting in a kernel. The convergence speed for all poverty-weighted PPPs are presented in Figures 2 and 3.

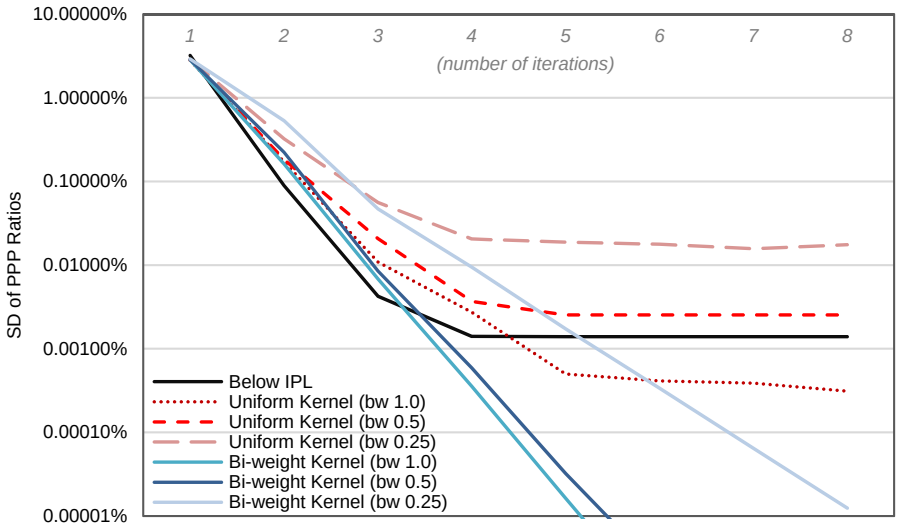

FIGURE 2. ITERATION CONVERGENCE OF POVERTY-WEIGHTED PPPS, 28 COUNTRIES

In the case of 28 countries, the fastest convergence, as expected, is produced by the bi-weight kernel based PPPs with bandwidths of 1.0 and 0.5. The same kernel with a bandwidth of 0.25 converges significantly slower. Poverty-weighted PPPs based on plutocratic weights below the IPL ("below IPL PPPs") converge relatively fast in the beginning but then start oscillating. All indexes based on uniform kernels exhibit oscillations as well. It could be noticed that the only country that oscillated with the below IPL PPPs was Guinea. Removal of the Guinea data from the data set produces somewhat more consistent results for all indexes, with the below IPL PPPs discontinuing the oscillations altogether.

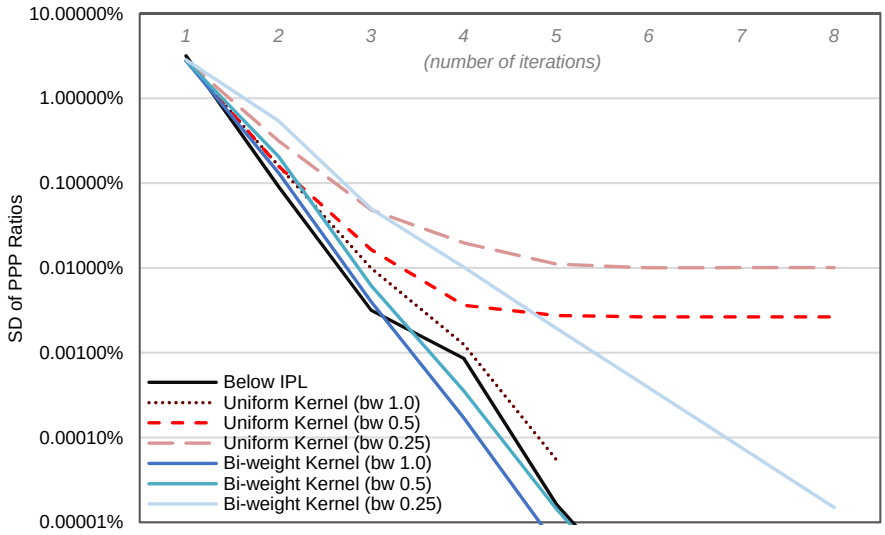

FIGURE 3. ITERATION CONVERGENCE OF POVERTY-WEIGHTED PPPS WITHOUT GUINEA, 27 COUNTRIES

The results without Guinea price data are presented in Figure 2. In general, the convergence picture is quite similar to the 28 country case. As before, the fastest convergence is produced by the bi-weight

kernels with bandwidths of 1.0 and 0.5. The below IPL PPPs converge relatively fast as well. In this case, the uniform kernel with bandwidth 1.0 converges fully. The only two indexes that produce oscillations are based on the uniform kernels with bandwidths 0.5 and 0.25.

The reason why one country could have such an effect lies in the lumpiness (i.e., discontinuity) of actual household survey expenditure data. For example, if a certain number of households in some country around the poverty line exhibited a rather unusual weight structure combined with an uneven density of the probability density function, it would result in oscillations for the below-IPL index. This has nothing to do with the methodology employed, but rather reflects imperfections of the original household expenditure data. Smoothing the input data would solve the problem and at the same time would make the household expenditure data more realistic, without affecting much the resulting PPPs.

How critical are the oscillations in these PPP calculations? It turns out they are quite insignificant. From Figures 2 and 3 we can see that in the worst case scenario—uniform kernel with bandwidth 0.25—the oscillations are around 0.01% (!) on average, which is several orders of magnitude better than expected precision of the PPP computation.

It also turns out that all bandwidth of kernel based PPPs produce very similar results, with most countries having results with a standard deviation (SD) of around 0.1–0.2%.[12] Only the Gabon poverty weighted-PPPs have an SD of 0.4% (see Figure 4), with the bi-weight poverty-weighted PPPs systematically higher than their uniform kernel based counterparts (see Table A1 (annex)). This is probably related to some peculiarities of Gabon's probability distribution function.

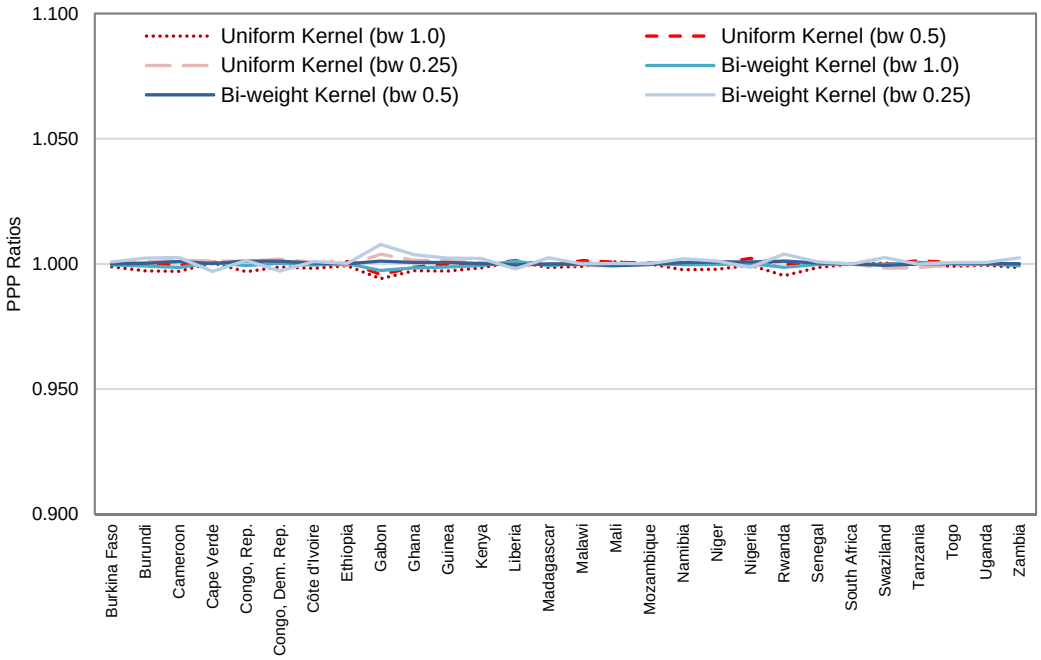

FIGURE 4. EFFECT OF KERNEL TYPE AND BANDWIDTH ON POVERTY-WEIGHTED PPPS, 28 COUNTRIES

4.3 Poverty-reweighted PPPs according to various methods

4.3.1 Effect of removing one country

We have seen the effect of removing Guinea on the convergence of poverty-weighted PPPs, now let us look at this effect on the regular consumption PPPs based on expenditures from the national accounts ("SNA-based PPPs"). The results for SNA-based PPPs are shown in Figure 5. The scale is intentionally

[12] SD is estimated with respect to the regional unweighted geometric mean in order to remove the base country effect.

kept the same as in Figure 4 for easy comparisons. The average effect of removing one country on the rest of countries is around 0.11% in this case.

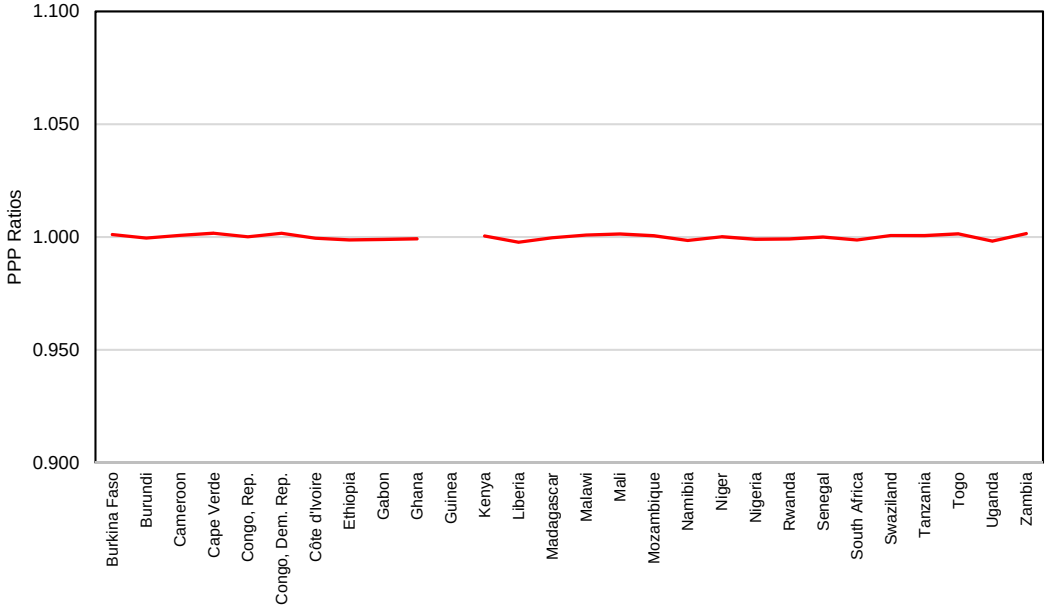

FIGURE 5. EFFECT OF REMOVAL OF GUINEA ON SNA-BASED PPPS, 27 COUNTRIES

Next, we examine the effect of removing Guinea on the below IPL and kernel based poverty-weighted PPPs. Figure 6 shows that the below IPL and kernel based poverty-weighted PPPs change insignificantly in this case, with the below IPL PPPs being more stable. All kernel based PPPs display very similar magnitudes of the effect, with the biggest effect being for Rwanda (for the 27 country case, the SD of the effect was 0.19–0.23%). Interestingly, Rwanda's PPP was quite stable under the below-IPL PPP computation.

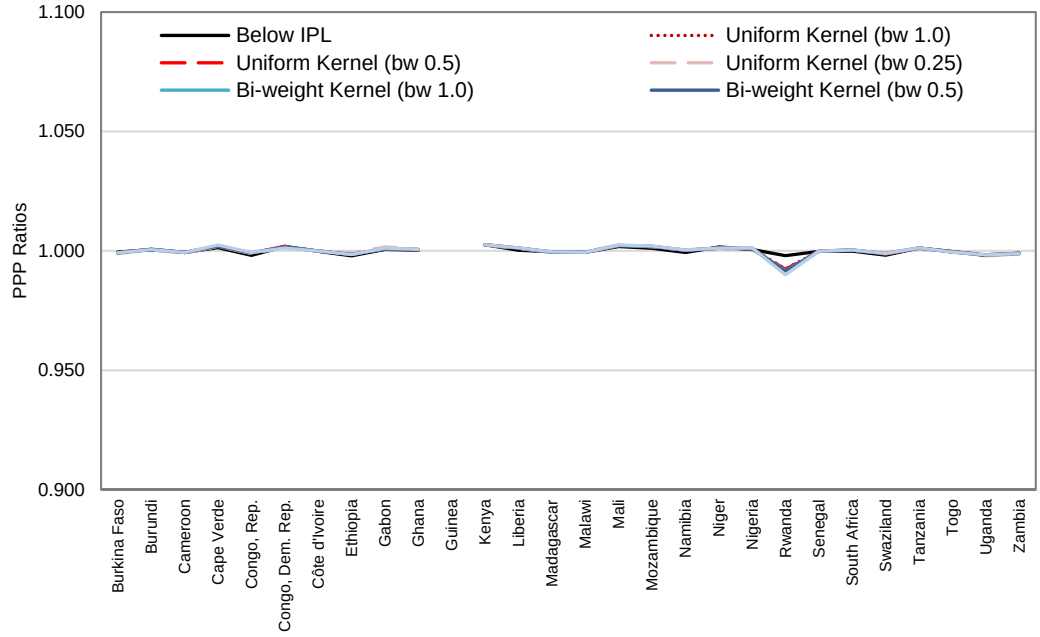

FIGURE 6. EFFECT OF REMOVAL OF GUINEA ON POVERTY-WEIGHTED PPPS, 27 COUNTRIES

4.3.2 Effect of moving from below IPL PPPs to kernel based PPPs

Once we established that all kernel based PPPs were quite similar, and the country-removal effect was of a quite limited importance, the next step would be to study the effect of moving from the below IPL PPPs to the kernel based PPPs. This effect is presented in Figure 7, with the biggest outlier being Rwanda with a 3.2–3.8% difference. We can also see that the SD of the differences in country poverty-weighted PPPs is 1.0–1.1% depending on the kernel. Those numbers again exceed the expected error in the ICP PPP computation.

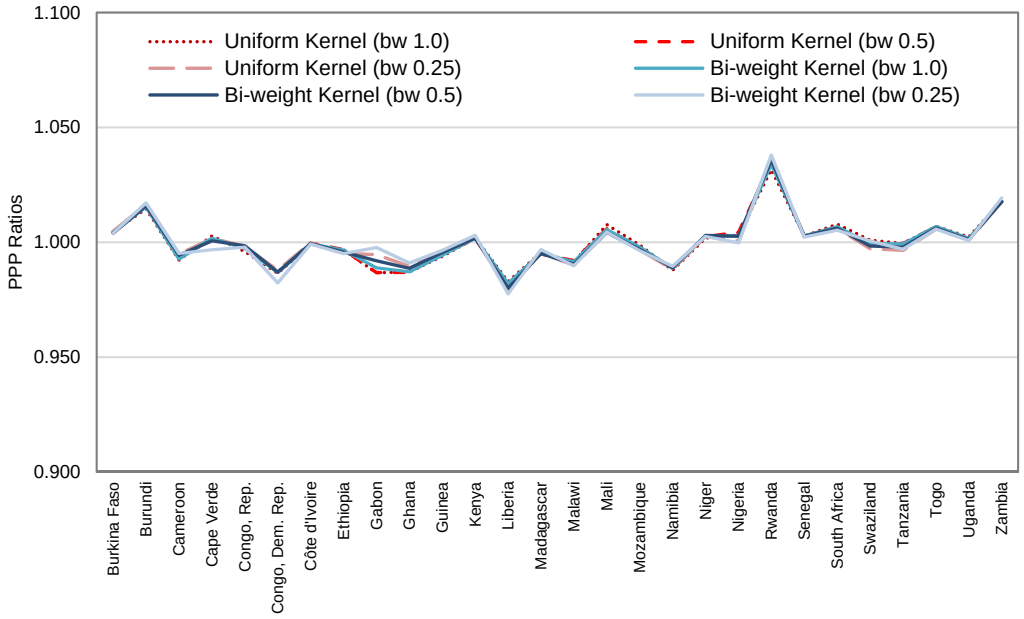

FIGURE 7. EFFECT OF MOVING FROM BELOW IPL PPPS TO KERNEL BASED PPPS, 28 COUNTRIES

4.3.3 Effect of poverty-weighted PPPs on poverty rates

With the poverty-weighted PPPs according to various definitions being that close to one another, the country poverty rates they generate are quite close as well. These poverty rates are presented in Table A3 (annex). We can see that all kernel based poverty weighted PPPs produce virtually identical poverty rates. Those poverty rates are also quite close to those originating from the below-IPL PPPs.

4.3.4 Effect of moving from SNA-based PPPs to poverty-weighted PPPs

Finally, we are going to look into the effect of going from SNA-based PPPs to poverty-weighted PPPs. This effect is presented in Figure 8. One thing to note is that the effects in Figure 8 are significantly larger than those presented earlier. The resulting SDs for the various types of poverty-weighted PPPs estimated are 2.7–3.1%. These numbers are still significantly better than the expected precision of ICP PPPs (a 5–10% range). Again, all the kernel based PPPs and the below IPL PPPs are quite close to each other.

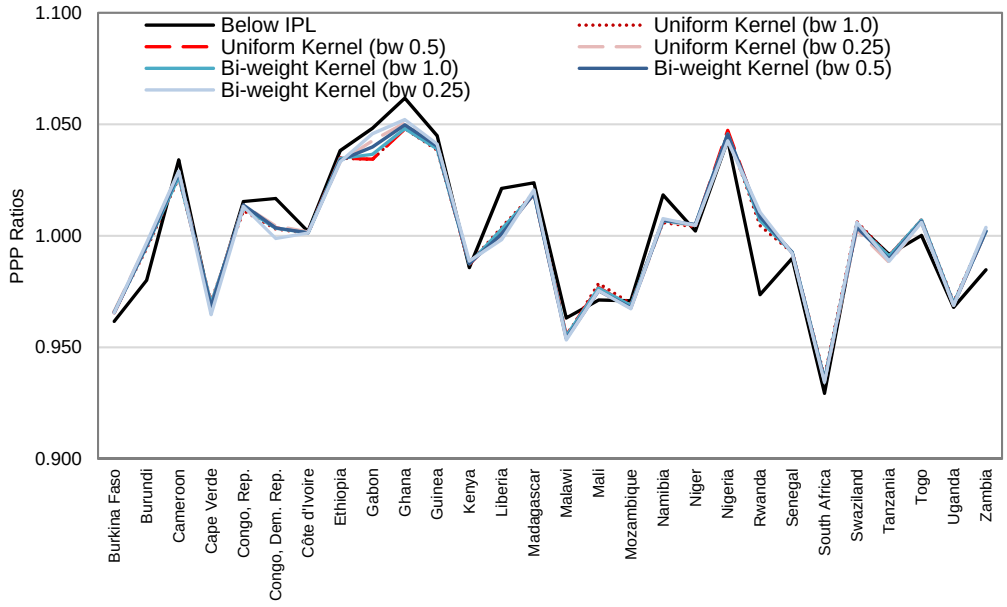

FIGURE 8. EFFECT OF MOVING FROM SNA-BASED PPPS TO VARIOUS POVERTY-WEIGHTED PPPS, 28 COUNTRIES

5. *Poverty-specific PPPs: Removing irrelevant items*

5.1 Method and approach

We now turn our focus away from the basic heading level and toward the item level. The poverty-specific PPPs in the previous section attenuated the influence of basic headings irrelevant to the poor through reweighting. However, if we want to produce PPPs untainted by any possible influence of items irrelevant to the poor, then the reweighting process is by and large effective, but by no means sufficient. Items seldom consumed by the poor, such as extra virgin olive oil, would still be present within basic headings like "other edible oils and fats"; which, overall, have an important role in the consumption basket of both poor and non-poor.

As mentioned before, the inclusion of items that are arguably irrelevant to the poor in ICP consumption PPPs has often raised doubts on their applicability for poverty analysis. However, the effect (if any) of constructing consumption PPPs that exclude the price of, say, extra virgin olive oil or Kellogg's Cornflakes is not immediately evident.

In light of this, we produce new consumption PPPs with items deemed irrelevant to the poor removed from the calculation. We refer to these poverty-specific PPPs as reduced-list PPPs and produce three scenarios: (1) after removing items priced only in supermarkets, (2) after removing clothing and footwear items belonging to a *medium* or *high* brand stratum (for brevity, we name them "branded garments & footwear"); and (3) after removing food and nonalcoholic beverage items that we categorized as *premium* beforehand.

Within each reduced-list scenario, we computed two sets of PPPs for each of the 50 African countries. First, a full-list set, based on the full basket of items used for collecting prices for the 2011 ICP in Africa, and, second, a counterfactual reduced-list set after removing items deemed irrelevant according to each scenario.[13] Basic heading PPPs for the two sets, in each of the three scenarios, were estimated using the

[13] Full-list PPPs were only estimated for expenditure categories for which counterfactual PPPs were also produced. Otherwise, published 2011 ICP PPPs were used. Hence, the full-list PPPs for the 'supermarket only' and 'premium food and nonalcoholic' items are equivalent, but differ slightly from the full-list PPPs for the 'excluding branded clothing & footwear' scenario.

CPD method in its unweighted form. For comparison purposes all basic heading PPPs were then aggregated to the level of household consumption using the GEKS-Fisher procedure.

Depending on the reduced-list scenario, the removal of items was contained to either the "food and non-alcoholic beverages" or the "clothing and footwear" ICP expenditure categories. These two categories were chosen because of their importance as basic necessities as well as for practical reasons. It turns out that the product dataset for the 2011 ICP Africa comparison contains quite detailed and harmonized metadata for items belonging to both categories.

Determining what items to remove in each reduced-list scenario was not without its problems. At first, it would seem that the main difficulty lies in the circularity of the task at hand: it is necessary to consistently identify the poor in each country before assessing what items they consume. Yet, while the circularity is indeed an obstacle, it can be solved using the iterative procedure employed in Section 4. Instead, the lack of item-level detail in most of the household expenditure surveys proved to be the more intractable problem is. On this front, we mined the micro data from household expenditure surveys in 28 Sub-Saharan Africa countries and concluded that their item-level detail is generally insufficient to properly distinguish item-varieties and establish a one-to-one mapping with ICP items.

Given this constraint, we chose the practical alternative of using information from the ICP product data set for Africa mentioned above to identify items that one would expect to be outside the consumption basket of the poor. To identify items priced only in supermarkets we used information from the "required outlet type" field provided for each item. In the case of garments and footwear, we stratified items within the "garments" and "shoes and other footwear" basic headings as branded or unbranded by exploiting the available item-level brand stratum information (*high*, *medium*, or *low*). As stated earlier, we grouped and labeled all *high* and *medium* garments and footwear as branded for brevity even if some *low* items also include some brand specification. Lastly, for the premium food and nonalcoholic beverages scenario we removed items with a relatively high (per-unit) price across all countries within each basic heading, and assume a linear relationship between quantity and prices for each item.

We must underline that all three approaches are not without their drawbacks, but we cannot do any better given the current set of data. Nevertheless, market consumer reports by Nielsen (2014) and information from the Food and Agriculture Organization (2015) indicate that the poor in many African countries rarely shop in supermarkets. Likewise, it is not unreasonable to assume that high brand stratum garments and clothing are outside the scope of what the poor consume, at least on average.

5.2 Poverty-specific PPPs by reduced-list scenario

To measure the effect of moving from PPPs based on a full-list to PPPs based on a reduced-list, we compute the SD across (normalized) relative differences in country PPPs due to the shift.[14] These relative difference in PPPs are captured by the ratio between a country's reduced-list PPP and its full-list PPP ("PPP ratio").[15] The SDs of the normalized PPP ratios in each scenario are presented in Table 2, while country PPP ratios by reduced-list scenario are available in Table A5 (annex).

TABLE 2 — EFFECT OF REMOVING ITEMS (*BY REDUCED-LIST SCENARIO*), 50 COUNTRIES

Reduced-list (poverty-specific) scenario	SD of normalized PPP ratios
(1) Removing supermarket only items	0.88 %
(2) Removing branded garments & footwear items	0.29 %
(3) Removing *premium* food & nonalcoholic beverages items	0.73%

Source: Authors' calculations

[14] All PPP ratios presented are based on normalized country PPPs with respect to the regional geometric mean. This normalization procedure removes the base-country effect that would occur otherwise.

[15] A PPP ratio greater (less) than 1.00 denotes an increase (decrease) in country PPP, relative to the region, due to the shift from a full-list to a reduced-list.

Table 2 reveals that the reduced-list PPPs in each scenario are not much different from their full-list analogues, as evidenced by the SDs. The effect of moving from a full-list set of consumption PPPs to each reduced-list scenario is displayed in Figure 9.

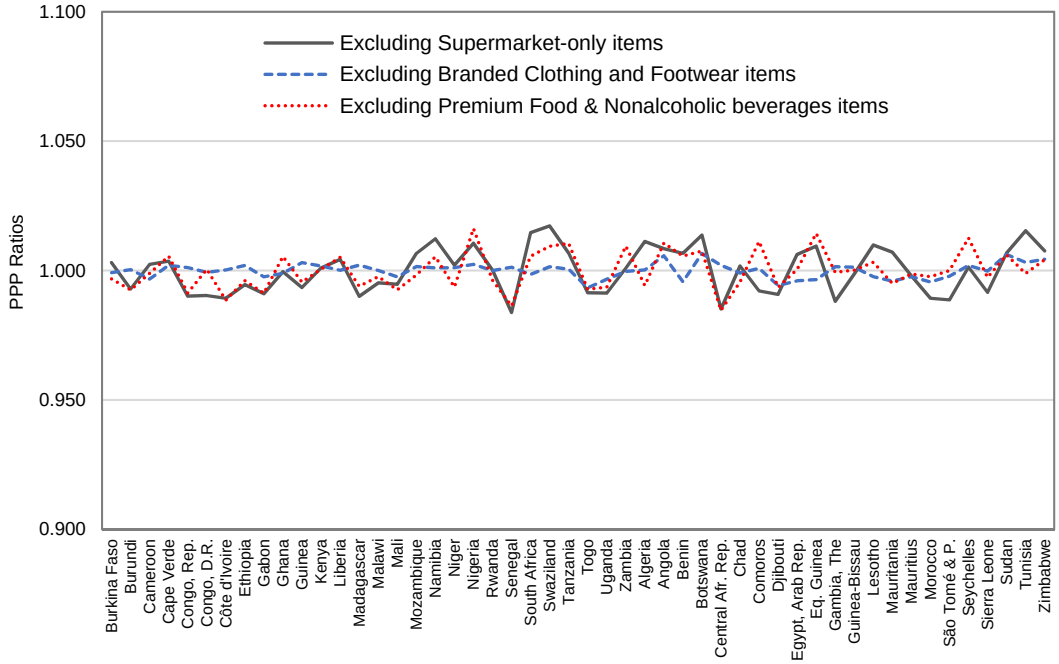

FIGURE 9. EFFECT OF MOVING FROM FULL-LIST PPPS TO REDUCED-LIST PPPS, 50 COUNTRIES

These results imply that the impact of removing items from the consumption PPPs is negligible for the three scenarios studied. In fact, the SDs of the PPP ratios for each scenario are below the ± 5–10% precision band accepted as target for the ICP PPPs. With this in mind, we proceed to examine each reduced-list scenario in more detail.

5.2.1 Effect of moving from full-list PPPs to PPPs excluding supermarket only items

Figure 9 illustrates the (negligible) effect of moving from a full-list set of consumption PPPs to one excluding supermarket only items. In total, 41 items out of the 367 food and nonalcoholic beverage items were removed.

The SD of the relative differences in country PPPs due to removing supermarket only items was 0.88%, as indicated earlier. Swaziland and Senegal had the most changes in their consumption PPPs, but these were still only [+]1.72% and [-]1.62%, respectively.

Regression results in Table A4 (annex) indicate a positive statistically significant relationship between country income and the resulting change in country's PPP after excluding supermarket items. However, the size of the effect is extremely small—it amounts to a 1% price increase over a 12-fold difference in country income levels. The effect indicates that non-supermarket prices in richer African countries may be relatively higher than those in poorer African countries. A possible explanation is that non-supermarket items are specified looser, and poorer countries may be pricing lower quality varieties. In any case, given that the magnitude of the effect is trivial, the impact of any association between income and changes in PPP is close to null.

5.2.2 Effect of moving from full-list PPPs to PPPs excluding branded clothing and footwear items

For this scenario, poverty irrelevant items under the "garments" and "shoes and other footwear" basic headings were removed to calculate the reduced list PPPs. The "garments" basic heading contains 65 items among which 23 are *low* stratum, while the "shoes and other footwear" basic heading contains 20 items among which 7 are *low* stratum. Only *low* stratum items were retained in our calculation of poverty-specific PPPs for this scenario.

The change from a full-list to a reduced-list with only *low* brand stratum garment items resulted in a SD at the garment basic heading level of 6.33% across all countries, with no specific pattern. At the household consumption level, the SD of the PPP changes across all countries was 0.29%.

The extent of the changes in country consumption PPPs for this scenario can be observed in Figure 9. Botswana showed the largest increase in its PPP at 0.66%, whereas Togo had the largest relative decrease at 0.67%. No significant relationship was found between country income and the resulting change in country's PPPs after excluding branded clothing and footwear items (see Table A4, annex).

5.2.3 Effect of moving from full-list PPPs to PPPs excluding premium food & nonalcoholic beverage items

By assuming that the poor are less likely to consume those items that are relatively expensive across all countries (within each basic heading), we removed 61 out of the 367 food and nonalcoholic beverage items priced in Africa. The effect of removing these *premium* food and nonalcoholic beverage items on the country PPP ratios is shown in Figure 9.

It is remarkable that the effect of moving from a full-list set of consumption PPPs to one without *premium* food and nonalcoholic beverages was even smaller in this scenario than in the supermarket only scenario, despite removing 20 more items in the former. As with the other reduced-list scenarios, the effect of this shift was small and practically random in its outcome across countries. This is again evident by the regression results in Table A4 (annex).

As a final and general observation for the item-level section, we must add that there could be many factors affecting the price level of the poor and they could even work in opposite directions. For instance, without further analysis, it is impossible to quantify to which degree the poor benefit from economies of scale versus the rich. Similarly, we do not know how item availability in rural areas, where many of the poor live and where many items are not even available, affect the effective price level faced by the poor.

6. *Conclusions*

With the new $1.90 IPL and new 2011 ICP PPPs, it was important to see if the Deaton and Dupriez (2011) conclusion on poverty-weighted PPPs being close to ICP PPPs still holds, especially given the changes in ICP methodology that occurred since 2005. This paper found that the conclusion does indeed hold: the deviation between the two is around 2.7–3.1% on average, which is below the expected precision of ICP consumption PPPs of ±5–10%.

In addition, the uniform kernel was employed alongside the bi-weight kernel, to study the effects of kernel shape. Those were contrasted with the below IPL plutocratic consumption PPPs. It was found that all the kernels with various bandwidths produced virtually identical results, and those results were very similar to the PPPs obtained with the below IPL plutocratic index.

All indexes based on kernels and the below IPL PPPs, converged fast in the practical sense, meaning that even though they sometimes oscillated, the degree of oscillation was immaterial. All the indexes employed exhibited a high degree of stability to the selection of countries.

At the same time, the overall effect of removing items from consumption PPPs has been shown to be negligible. Yet, it is important to acknowledge that by using the same set of prices in each of the calculations, it is implicitly assumed that the poor face the same prices as the non-poor. In addition, some critics have pointed out that poverty-specific PPPs should be constructed on the basis of prices paid by the poor. We do not address this issue, since unfortunately studying it fully would require a separate price

collection, parallel to the ICP. Instead, we attempted to examine feasible aspects related to the construction of poverty-specific PPPs. Future work at the item-level will explore whether the results from this section can be generalized to other item groupings or groups of countries.

7. *Annex*

TABLE A1 — KERNEL STABILITY, 28 COUNTRIES

		Poverty-weighted PPPs: *Kernel based* vs. *Below IPL*						
	SNA-based vs. Below IPL PPPs	Uniform; Bandwidth =1.0	Uniform; Bandwidth =0.5	Uniform; Bandwidth =0.25	Bi-weight; Bandwidth =1.0	Bi-weight; Bandwidth =0.5	Bi-weight; Bandwidth =0.25	SD for kernels
Burkina Faso	1.0398	1.0046	1.0041	1.0048	1.0043	1.0041	1.0040	0.031%
Burundi	1.0204	1.0146	1.0160	1.0165	1.0154	1.0159	1.0172	0.081%
Cameroon	0.9671	0.9923	0.9931	0.9948	0.9927	0.9944	0.9951	0.109%
Cabo Verde	1.0332	1.0028	1.0014	1.0017	1.0018	1.0007	0.9968	0.192%
Congo, Rep.	0.9848	0.9960	0.9978	0.9983	0.9973	0.9985	0.9979	0.081%
Congo, D.R.	0.9835	0.9865	0.9870	0.9878	0.9868	0.9870	0.9823	0.180%
Côte d'Ivoire	0.9980	0.9992	0.9996	0.9998	0.9994	0.9994	0.9992	0.021%
Ethiopia	0.9632	0.9968	0.9968	0.9951	0.9966	0.9958	0.9951	0.073%
Gabon	0.9540	0.9867	0.9868	0.9947	0.9889	0.9920	0.9977	0.409%
Ghana	0.9418	0.9872	0.9870	0.9895	0.9872	0.9887	0.9910	0.148%
Guinea	0.9570	0.9938	0.9950	0.9962	0.9944	0.9955	0.9965	0.094%
Kenya	1.0144	1.0019	1.0014	1.0021	1.0018	1.0018	1.0030	0.051%
Liberia	0.9791	0.9829	0.9818	0.9794	0.9821	0.9800	0.9776	0.183%
Madagascar	0.9767	0.9956	0.9949	0.9954	0.9952	0.9952	0.9968	0.062%
Malawi	1.0382	0.9914	0.9920	0.9901	0.9916	0.9905	0.9898	0.083%
Mali	1.0296	1.0077	1.0059	1.0042	1.0055	1.0044	1.0044	0.122%
Mozambique	1.0300	0.9988	0.9975	0.9967	0.9980	0.9969	0.9964	0.083%
Namibia	0.9820	0.9878	0.9888	0.9882	0.9887	0.9889	0.9896	0.055%
Niger	0.9978	1.0019	1.0025	1.0026	1.0027	1.0030	1.0025	0.033%
Nigeria	0.9589	1.0031	1.0043	1.0007	1.0027	1.0026	0.9997	0.153%
Rwanda	1.0270	1.0317	1.0347	1.0360	1.0340	1.0359	1.0380	0.194%
Senegal	1.0102	1.0027	1.0028	1.0026	1.0028	1.0027	1.0023	0.016%
South Africa	1.0759	1.0079	1.0063	1.0061	1.0068	1.0061	1.0053	0.079%
Swaziland	0.9946	1.0010	0.9988	0.9972	0.9994	0.9984	1.0006	0.129%
Tanzania	1.0084	0.9995	0.9995	0.9965	0.9993	0.9979	0.9970	0.121%
Togo	0.9998	1.0069	1.0068	1.0057	1.0069	1.0062	1.0058	0.050%
Uganda	1.0330	1.0023	1.0014	1.0009	1.0017	1.0012	1.0008	0.051%
Zambia	1.0155	1.0180	1.0177	1.0176	1.0176	1.0177	1.0193	0.061%

Notes: All ratios are based on country PPPs normalized with respect to the regional geometric mean.
Source: Authors' calculations.

TABLE A2 — CONSUMPTION PPPs (*BY VARIOUS METHODS*), 28 COUNTRIES

		Poverty-weighted PPPs						
			Kernel based					
	SNA -based	Below IPL	Uniform; Bandwidth = 1.0	Uniform; Bandwidth = 0.5	Uniform; Bandwidth = 0.25	Bi-weight; Bandwidth = 1.0	Bi-weight; Bandwidth = 0.5	Bi-weight; Bandwidth = 0.25
Burkina Faso	43.9130	45.4372	45.2897	45.3369	45.3795	45.3248	45.3454	45.3782
Burundi	96.0123	101.2418	101.9139	102.2206	102.2853	102.1098	102.2239	102.4390
Cameroon	45.6249	50.7609	49.9746	50.0972	50.1918	50.0507	50.1688	50.2484
Cabo Verde	9.4389	9.8289	9.7787	9.7811	9.7861	9.7801	9.7754	9.7458
Congo, Rep.	58.6076	64.0289	63.2751	63.4865	63.5320	63.4258	63.5418	63.5559
Congo, D.R.	106.5974	116.6190	114.1441	114.3872	114.5000	114.3074	114.4036	113.9557
Côte d'Ivoire	46.7349	50.3859	49.9498	50.0506	50.0682	50.0132	50.0503	50.0823
Ethiopia	1.0883	1.2157	1.2023	1.2043	1.2025	1.2034	1.2033	1.2034
Gabon	72.0245	81.2330	79.5258	79.6582	80.3077	79.7871	80.0902	80.6216
Ghana	0.1572	0.1796	0.1759	0.1761	0.1766	0.1761	0.1765	0.1770
Guinea	511.2631	574.7884	566.7677	568.3278	569.1281	567.6834	568.7267	569.7393
Kenya	7.1100	7.5411	7.4966	7.5045	7.5113	7.5033	7.5087	7.5242
Liberia	0.1141	0.1254	0.1223	0.1223	0.1220	0.1223	0.1221	0.1219
Madagascar	138.7776	152.8748	151.0046	151.1476	151.2398	151.1086	151.2124	151.5877
Malawi	15.6651	16.2343	15.9678	16.0045	15.9754	15.9888	15.9816	15.9838
Mali	44.1795	46.1674	46.1589	46.1505	46.0811	46.1090	46.0871	46.1282
Mozambique	3.0803	3.2177	3.1887	3.1897	3.1875	3.1894	3.1882	3.1891
Namibia	1.0222	1.1200	1.0977	1.1005	1.1001	1.0999	1.1008	1.1025
Niger	45.2824	48.8294	48.5378	48.6466	48.6568	48.6300	48.6753	48.6954
Nigeria	15.8033	17.7322	17.6479	17.6964	17.6360	17.6606	17.6702	17.6342
Rwanda	48.9167	51.2475	52.4573	52.6931	52.7712	52.6311	52.7614	52.9129
Senegal	48.6598	51.8278	51.5589	51.6465	51.6459	51.6205	51.6495	51.6736
South Africa	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Swaziland	0.8073	0.8732	0.8673	0.8667	0.8655	0.8668	0.8665	0.8692
Tanzania	116.3640	124.1585	123.1184	123.3150	122.9697	123.2283	123.1397	123.1324
Togo	46.1151	49.6279	49.5807	49.6512	49.6089	49.6310	49.6328	49.6519
Uganda	188.0210	195.8339	194.7488	194.8732	194.8216	194.8488	194.8771	194.9641
Zambia	494.2969	523.7306	528.9606	529.6466	529.6952	529.3684	529.7731	531.0393

Notes: South Africa is the numeraire country (South African rand=1)
Source: Authors' calculations.

TABLE A3 — EFFECT OF VARIOUS POVERTY-WEIGHTED PPPs ON POVERTY RATES, 28 COUNTRIES

	Below IPL	Kernel based					
		Uniform; Bandwidth = 1.0	Uniform; Bandwidth = 0.5	Uniform; Bandwidth = 0.25	Bi-weight; Bandwidth = 1.0	Bi-weight; Bandwidth = 0.5	Bi-weight; Bandwidth = 0.25
Burkina Faso	59.4	59.2	59.2	59.3	59.2	59.2	59.2
Burundi	84.9	85.1	85.2	85.2	85.2	85.2	85.3
Cameroon	31.5	30.7	30.8	30.8	30.7	30.8	30.9
Cabo Verde	5.6	5.5	5.5	5.5	5.5	5.5	5.4
Congo, Rep.	39.5	38.8	38.9	39.0	38.8	39.0	39.0
Congo, D.R.	95.7	95.4	95.4	95.5	95.4	95.4	95.4
Côte d'Ivoire	26.4	26.0	26.1	26.1	26.1	26.1	26.1
Ethiopia	43.5	42.8	42.9	42.8	42.8	42.8	42.8
Gabon	9.4	9.1	9.1	9.2	9.1	9.2	9.3
Ghana	12.6	12.0	12.0	12.1	12.0	12.0	12.1
Guinea	62.4	61.8	61.9	61.9	61.8	61.9	61.9
Kenya	31.2	30.9	31.0	31.0	31.0	31.0	31.1
Liberia	58.0	55.5	55.5	55.5	55.5	55.5	55.5
Madagascar	85.1	84.8	84.8	84.8	84.8	84.8	84.8
Malawi	72.7	71.9	72.1	71.9	72.0	72.0	72.0
Mali	56.8	56.8	56.8	56.8	56.8	56.8	56.8
Mozambique	73.8	73.4	73.4	73.4	73.4	73.4	73.4
Namibia	26.4	25.5	25.6	25.6	25.6	25.6	25.7
Niger	74.8	74.6	74.6	74.6	74.6	74.6	74.6
Nigeria	54.2	54.1	54.1	54.0	54.1	54.1	54.0
Rwanda	67.4	68.4	68.5	68.6	68.5	68.6	68.6
Senegal	60.2	60.0	60.1	60.1	60.1	60.1	60.1
South Africa	13.4	13.4	13.4	13.4	13.4	13.4	13.4
Swaziland	55.5	55.4	55.4	55.4	55.4	55.4	55.5
Tanzania	48.3	47.8	47.9	47.7	47.9	47.8	47.8
Togo	68.5	68.5	68.6	68.5	68.6	68.6	68.6
Uganda	45.7	45.5	45.5	45.5	45.5	45.5	45.5
Zambia	66.5	66.8	66.8	66.8	66.8	66.8	67.0

Source: Authors' calculations.

TABLE A4 — PPP RATIOS REGRESSED ON GDP PER CAPITA AND REGIONAL BLOCS, 50 COUNTRIES

	Excluding supermarket only items		Excluding branded garments & footwear items		Excluding premium food nonalcoholic beverages items	
	(1)	(2)	(3)	(4)	(5)	(6)
	ln (Normalized PPP Ratio)	*ln* (Normalized PPP Ratio)	*ln* (Normalized PPP Ratio)	*ln* (Normalized PPP Ratio)	*ln* (Normalized PPP Ratio)	*ln* (Normalized PPP Ratio)
ln (GDP per capita, 2011 PPP)	0.00398***	0.00287*	-0.0000484	-0.000130	0.00280**	0.00280*
	(0.00112)	(0.00116)	(0.000399)	(0.000407)	(0.000991)	(0.00122)
Economic Community Of West African States (ECOWAS)		0.00104		-0.000210		0.000513
		(0.00262)		(0.00131)		(0.00272)
Economic Community of Central African States (ECCAS)		-0.00345		-0.00118		-0.00305
		(0.00311)		(0.00140)		(0.00326)
Southern African Development Community (SADC)		0.00798**		0.00137		0.00469
		(0.00258)		(0.00147)		(0.00241)
Arab Maghreb Union (UMA)		0.00535		-0.00113		-0.00569*
		(0.00563)		(0.00221)		(0.00264)
Constant	4.573***	4.580***	0.000387	0.00103	-0.0224**	-0.0228*
	(0.00880)	(0.00874)	(0.00310)	(0.00291)	(0.00781)	(0.00953)
N	50	50	50	50	50	50
R^2	0.207	0.397	0.000	0.099	0.150	0.334
Adjusted R^2	0.191	0.328	-0.021	-0.003	0.133	0.258
Root MSE	0.00800	0.00728	0.00294	0.00291	0.00683	0.00632

Base dummy group: Common Market for Eastern and Southern Africa (COMESA)
Robust standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: Authors' calculations. GDP per capita (2011 PPP adjusted) from the World Bank World Development Indicators (WDI).

TABLE A5—FULL-LIST AND REDUCED-LIST PPPs, 50 COUNTRIES

	(1) Supermarket only items			(2) Branded garments & footwear items			(3) Premium food & non-alcoholic beverages items		
	Full-list PPP	Reduced-list PPP*	Normalized PPP ratio	Full-list PPP	Reduced-list PPP*	Normalized PPP ratio	Full-list PPP	Reduced-list PPP*	Normalized PPP ratio
Burkina Faso	43.508	43.012	1.003	43.885	43.917	0.999	43.508	43.128	0.997
Burundi	97.962	95.856	0.993	96.286	96.467	1.000	97.962	96.691	0.993
Cameroon	45.188	44.642	1.002	45.358	45.277	0.997	45.188	44.890	0.999
Cabo Verde	9.325	9.223	1.004	9.383	9.416	1.002	9.325	9.324	1.006
Congo, Rep.	57.886	56.485	0.990	58.480	58.637	1.001	57.886	57.067	0.991
Congo, D.R.	105.720	103.188	0.990	106.079	106.166	0.999	105.720	105.187	1.001
Côte d'Ivoire	46.036	44.884	0.989	46.492	46.575	1.000	46.036	45.258	0.989
Ethiopia	1.053	1.032	0.995	1.074	1.077	1.002	1.053	1.043	0.996
Gabon	70.162	68.527	0.991	70.817	70.755	0.998	70.162	69.166	0.991
Ghana	0.155	0.152	1.000	0.155	0.155	0.999	0.155	0.155	1.005
Guinea	500.519	490.046	0.993	507.403	509.728	1.003	500.519	495.516	0.996
Kenya	6.995	6.901	1.001	6.988	7.011	1.002	6.995	6.961	1.001
Liberia	0.111	0.110	1.004	0.112	0.112	1.000	0.111	0.111	1.005
Madagascar	138.833	135.463	0.990	139.062	139.564	1.002	138.833	137.230	0.994
Malawi	15.274	14.981	0.995	15.391	15.415	1.000	15.274	15.154	0.998
Mali	43.251	42.399	0.995	43.742	43.701	0.998	43.251	42.693	0.993
Mozambique	3.022	2.998	1.007	3.063	3.073	1.002	3.022	3.000	0.998
Namibia	1.019	1.017	1.012	1.012	1.015	1.001	1.019	1.019	1.005
Niger	44.825	44.270	1.002	45.132	45.250	1.001	44.825	44.294	0.994
Nigeria	15.492	15.430	1.011	15.681	15.743	1.002	15.492	15.656	1.016
Rwanda	47.761	47.078	1.000	48.716	48.792	1.000	47.761	47.319	0.996
Senegal	47.845	46.390	0.984	48.507	48.644	1.001	47.845	46.930	0.986
South Africa	1.000	1.000	1.015	1.000	1.000	0.998	1.000	1.000	1.006
Swaziland	0.794	0.796	1.017	0.798	0.800	1.001	0.794	0.797	1.009
Tanzania	115.241	114.336	1.007	115.461	115.698	1.001	115.241	115.807	1.011
Togo	45.189	44.152	0.991	45.802	45.564	0.993	45.189	44.617	0.993
Uganda	186.133	181.845	0.991	186.807	186.469	0.997	186.133	183.914	0.994
Zambia	496.642	489.901	1.001	494.529	495.113	1.000	496.642	498.556	1.009
Algeria	6.372	6.351	1.011	6.272	6.283	1.000	6.372	6.301	0.994
Angola	14.369	14.282	1.008	14.565	14.671	1.006	14.369	14.442	1.011
Benin	44.596	44.246	1.007	44.415	44.290	0.996	44.596	44.598	1.006
Botswana	0.879	0.878	1.014	0.875	0.883	1.007	0.879	0.880	1.008
Central Afr. Rep.	52.385	50.861	0.985	52.821	53.008	1.002	52.385	51.295	0.985
Chad	49.226	48.600	1.002	49.578	49.606	0.999	49.226	48.738	0.996
Comoros	43.168	42.211	0.992	43.500	43.602	1.001	43.168	43.412	1.011
Djibouti	20.149	19.674	0.991	20.019	19.934	0.994	20.149	19.908	0.994
Egypt, Arab Rep.	0.365	0.362	1.006	0.360	0.359	0.996	0.365	0.363	1.001
Eq. Guinea	63.060	62.735	1.009	63.393	63.269	0.997	63.060	63.610	1.014
Gambia, The	2.115	2.059	0.988	2.135	2.141	1.001	2.115	2.101	0.999
Guinea-Bissau	48.428	47.665	0.999	48.910	49.048	1.001	48.428	48.168	1.000
Lesotho	0.763	0.759	1.010	0.762	0.761	0.998	0.763	0.761	1.003
Mauritania	22.067	21.903	1.007	22.271	22.213	0.996	22.067	21.837	0.995
Mauritius	3.616	3.557	0.998	3.607	3.604	0.998	3.616	3.591	0.999
Morocco	0.824	0.804	0.989	0.827	0.824	0.996	0.824	0.818	0.998
São Tomé & Prin.	2000.69	1949.384	0.989	2011.39	2010.139	0.998	2000.69	1989.587	1.000
Seychelles	1.571	1.550	1.001	1.561	1.566	1.002	1.571	1.582	1.013
Sierra Leone	343.579	335.768	0.992	348.584	349.054	1.000	343.579	340.770	0.997
Sudan	0.290	0.288	1.007	0.291	0.293	1.006	0.290	0.290	1.006
Tunisia	0.138	0.138	1.015	0.137	0.138	1.003	0.138	0.137	0.999
Zimbabwe	0.104	0.103	1.008	0.106	0.106	1.004	0.104	0.104	1.004

*/ Indicates poverty-specific PPPs, i.e. *reduced list* poverty-specific PPPs.

Notes: Full- and reduced-list PPPs are reported with South Africa as the numeraire country (South African rand=1). PPP ratios are based on normalized country PPPs with respect to the regional geometric mean. For an explanation of normalized PPP ratios see footnote 15.

Source: Authors' calculations.

8. *References*

Asian Development Bank. 2008. “Research Study on 2005 International Comparison Program in Asia and the Pacific for Selected Countries in Asia and the Pacific - Poverty-specific Purchasing Power Parities”.

Deaton, Angus and Olivier Dupriez. 2011. "Purchasing Power Parity Exchange Rates for the Global Poor." *American Economic Journal: Applied Economics*, 3(2): 137-66.

Dupriez, Olivier. 2007. “Building a household consumption database for the calculation of poverty PPPs: Technical notes"

Food and Agriculture Organization of the United Nations. 2015. “Agricultural Growth in West Africa, Market and policy drivers.”

Nielsen. 2014. “Getting to Know the Diverse African Consumer.” Available at: http://www.nielsen.com/ssa/en/insights/news/2014/getting-to-know-the-diverse-african-consumer.html

Summers, Robert. 1973, “International Price Comparisons Based on Incomplete Data”, *Review of Income and Wealth*, 19(1), 1–16.

United Nations Statistical Commission. 2016. “Report on the forty-seventh session (8-11 March 2016).” Available at: https://unstats.un.org/unsd/statcom/47th-session/documents/Draft-report-on-the-47th-session-of-the-statistical-commission-Rev1-E.pdf

World Bank. 2015. “Operational Guidelines and Procedures for Measuring the Real Size of the World Economy: 2011 International Comparison Program”. Washington, DC: World Bank. Available at: http://www.worldbank.org/en/programs/icp/brief/2011-operational-guidelines