1 Introduction

During the past few decades, Uganda has experienced substantial economic growth. Since 1986, when the National Resistance Movement took over government, real gross domestic product (GDP) has grown at an annual rate of 6.8 per cent, making its economy one of the fastest growing in Africa. This growth has been attributed to the new government that has implemented a far-reaching economic reforms agenda, transforming Uganda into one of the most liberal economies in Africa south of the Sahara. Indeed, as argued in World Bank (1993: 22), the government 'liberalized the trade regime by abolishing export and import licensing; dismantled all price controls, which were few to begin with; repealed the Industrial Licensing Act, promulgated a new investment code, returned properties expropriated by the Amin regime and commenced privatizing public industrial enterprises; made important strides in abolishing export and distribution monopolies; embarked upon a major overhaul of the civil service; restructured the tax system and improved tax administration; and has made an impressive start in restructuring public expenditures towards critical economic and social services'. Such policy changes were seen as essential preconditions for sustainable economic growth.

This growth has been accompanied by equally impressive declines in the levels of poverty as reported by the government. While aggregate headcount poverty stood at about 57 per cent in the early 1990s, the most recent official estimate puts 19.5 per cent of the population below the official poverty line.[1] But despite these successes at the aggregate level, researchers warn that

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[1]For the most recent official estimate, we take the poverty estimate based on the 2012/13 Uganda National Household Survey (UNHS). The data on which these estimates are based were obtained from the Uganda Bureau of Statistics (UBOS) in August 2014. As is mostly the case with UNHS data obtained from UBOS, the dataset came with a compiled welfare aggregate based on consumption expenditure and a set of official poverty lines. Using the same methods we used to replicate official poverty figures in previous rounds of the UNHS, we estimate national headcount poverty to be 19.5 per cent in the UNHS 2012/13. This is slightly lower than official poverty estimates at the time of the UNHS 2012/13 dissemination and reported in the press (22.1 per cent).

this growth has not been shared equally by the population at large. For instance, marked spatial heterogeneity in baseline poverty and subsequent poverty reductions mean that differences in the standard of living between locations are often much higher now than what they used to be.

Apart from the observed heterogeneity in terms of poverty and poverty reduction, the figures itself have been called into question as well. Some argue that the lack of progress on assets accumulation and non-monetary well-being proxies suggest much more modest poverty reductions, raising suspicion about the poverty lines and the welfare indicator used by the government of Uganda (Daniels and Minot 2014; Kakande 2010). Some scholars have also been questioning the spatial pattern of poverty as reported in official documents, arguing that a single national food poverty line is likely to overstate poverty in some areas while underestimating poverty in others (Appleton 2003; Jamal 1998).

In this paper, we want to update existing knowledge about the state of poverty and its dynamics in Uganda, while at the same time address some of the problems with the official figures that have been identified in recent studies. To account for differences in diets in different locations, we will construct different poverty thresholds for different spatial domains using the latest available nationally representative household survey (UNHS 2012/13). For each spatial domain, we construct a food basket that produces a certain minimum of calories that reflects the diets of the poorest households in that region. These baskets are then multiplied by prices prevailing in that region to arrive at food poverty lines. An allowance for basic non-food necessities is then added to get a set of Cost of Basic Needs (CBN) poverty lines, one in each spatial domain. We then test these poverty lines to see if they are utility-consistent. The idea is that a basic needs bundle in a certain spatial domain A should always be cheaper than a bundle from any other region valued at prices of region A. If a bundle does not satisfy these revealed preference conditions, we use an information theoretic approach to adjust the bundles

until they do, as outlined in Arndt and Simler (2010).

While comparing poverty estimates using these new poverty lines with the official estimates is interesting in its own right, we will use the utility-consistent poverty lines to look at poverty dynamics using the recently released Uganda National Panel Survey (UNPS). The UNPS is a yearly panel survey collected by the Uganda Bureau of Statistics (UBOS) supported by the World Bank's Living Standard Measurement Study (LSMS) project that tracks about 3,000 households. We can use the panel nature of this survey to study how many households are chronically poor (defined as always falling below the poverty threshold) and investigate how their characteristics differ from other groups, such as households that successfully escaped poverty. In other words, we will construct a detailed poverty profile that takes dynamic aspects into account, defining groups based on poverty transitions instead of a simple dichotomous poor/non-poor status (Boateng et al. 1992). As for the characteristics we contrast within each group, we confine ourselves to those that change only slowly over time, and we look at the "initial conditions" at the start of the panel. We hope that this can enlighten us on the preconditions that need to be in place to be in a particular poverty dynamics group.[2]

The remainder of this paper is structured as follows: We first give an overview of poverty in the past few decades and look at the present official poverty estimates in Uganda. We also present some studies that point to shortcomings in official poverty measurement. In Section 3, we briefly explain the reasoning behind the use of spatially disaggregated poverty lines and the role of revealed preferences to test for utility consistency. Section 4 presents the construction of the new set of poverty lines and our poverty estimates based on the UNHS 2012/13. Section 5 then looks at poverty dynamics and relates households with differing poverty dynamics to a selection

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[2]For example, we could check if households that are always below the poverty line are different in terms of their reported ability to cope with adverse shocks at the start of the panel from those that grow out of poverty over the course of the panel.

of characteristics. A final section concludes.

2   Poverty in Uganda: Trends and controversies

During the 1990s, poverty in Uganda decreased substantially, falling by almost 40 per cent at the national level. Table 2 in Appleton (2003) presents official headcount poverty rates before the year 2000.[3] The table also shows significant spatial differences in both levels and changes in poverty. The urban areas and central region reduce poverty the fastest. The northern region, already starting from high levels of poverty, is relatively unsuccessful in bringing down the number of people living below the poverty line. In addition, studies that exploit the panel nature of the data find that in some regions, poverty is particularly persistent (Deininger and Okidi 2003). Also puzzling is the sudden drop between 1997/1998 and 1999/2000. Although it took five years for poverty to decrease by 20 per cent between 1992 and 1997, it took only two years to decrease another 20 per cent at the turn of the century. This may be due to inconsistent underlying welfare indicator data that were obtained from different surveys (the Monitoring Surveys and the Uganda National Household Survey, see footnote 3).

One controversy we will also address in this paper refers to the fact that the official poverty estimates are based on poverty lines that are rooted in a single food consumption bundle, derived from 1993/1994 Monitoring Survey data. In particular, a single food basket was identified at the national level with 28 of the most frequently consumed food items by households with less

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[3]There is a substantial literature on poverty and its dynamics in the 1990s. This is because of the relatively high quality data available for this period. Uganda has been conducting national household surveys since 1992, and conducted six such surveys before the turn of the millennium. Some of these datasets form a panel. The first dataset, the Integrated Household Survey conducted in 1992/1993 can be linked to the last survey of the millennium, referred to as the first Uganda National Household Survey (UNHS 1999/2000). Between these two surveys, a series of four Monitoring Surveys (1993/1994 up to 1997/1998) was carried out. More information on these data sets can be found in Lawson, Mckay, and Okidi (2006).

than the median income. The items in this food basket were then converted into caloric equivalents and scaled to generate 3,000 calories per adult equivalent per day using the World Health Organization (WHO) estimates for an 18-30-year-old male as a reference. Next, a non-food allowance was added. Non-food requirements were estimated as the average non-food expenditure of those households whose total expenditure was around the food poverty line. The non-food allowance does allow for spatial heterogeneity, as separate averages were calculated for urban and rural locations interacted with the four regions (central, eastern, northern, and western), using the method described in Ravallion and Bidani (1994). As far as we know, these poverty lines have since been updated by the official inflation figures each time a new household survey came out.

Appleton (2003) and Jamal (1998) argue that Uganda is unusual in its dietary diversity. Indeed, Uganda has five different staples, matooke, maize, sweet potatoes, cassava, and millet that are more or less important within the diet depending on the region. This may not matter very much if the diets are equally cost-effective in obtaining the same level of basic needs as defined in kilo-calories. However, the staple food of choice of a large part of the population, both in the western and the central regions, is matooke, a highly localized staple.[4] Appleton (2003) calculates that, at least in 1993-1994, matooke appeared to be a very expensive source of calories, compared with what people in, for instance, the north consume. When Appleton (2003) and Jamal (1998) account for this in their analysis, they come to the conclusion that poverty is more pronounced in the western region than found in official statistics. Even after correcting for income difference, as regions that consume more expensive calories may do so simply because they have higher incomes, Appleton (2003) comes to the conclusion that the western region overtakes even the northern region as the poorest.

Progress in fighting poverty reported by the government of Uganda and

[4]Matooke is a variety of starchy banana, commonly referred to as cooking bananas.

UBOS in the first decade of the new millennium is equally impressive. Table 1 shows that poverty at the national level kept falling during the first decade, shaving another 50 per cent off of headcount poverty. At the same time, differential progress in poverty reduction in different regions persists, too. For instance, by 2012/13, poverty is more than eight times higher in the northern region than in the central region. In 2002/2003, the north was only 2.7 times poorer than the central region. The more disaggregated the numbers, the starker the contrasts become. In the northeast, a semi-arid area with low rainfall inhabited by the Karamajong, an agro-pastoralist ethnic group, poverty remains stubbornly high, while in the central and western regions of the country, poverty is almost eradicated.[5]

The official poverty figures have been questioned in recent years for being overly optimistic. Daniels and Minot (2014) use Demographic and Health Survey (DHS) data and methods related to poverty mapping and small area estimation to look at poverty trends across Uganda from 1995 to 2010. They use the 2005/06 UNHS survey to estimate regressions that correlate poverty to a range of household characteristics that also appear in the DHS (four such surveys have been carried out between 1995 and 2009/10). They then use the DHS surveys to predict poverty in each of the DHS survey years. They find that poverty indeed reduced over time, but much slower than official figures suggest. While their national estimate of headcount poverty in 2006 is 33 per cent and thus very close to the official estimate of 2005/06, the rate still stands as 30 per cent using the 2009 DHS, about 6 percentage points higher than the 2009/10 UNHS estimate.

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[5]The northeastern subregion includes the districts of Kotido, Moroto, Nakapiripiriti, Katwaki, Amuria, Soroti, Kumi, and Kaberamaido; mid-northern includes Gulu, Kitgum, Pader, Apac, and Lira; West Nile includes Moyo, Adjumani, Yumbe, Arua, Koboko, and Nebbi; mid-western includes Masindi, Hoima, Kibaale, Bundibugyo, Kabarole, Kasese, Kyenjojo and Kamwenge; southwestern includes Bushenyi, Rukungiri, Kanungu, Kabale, Kisoro, Mbarara, and Ntungamo; eastern includes Kapchorwa, Mbale, Tororo, Sironko, Paliisa, and Busia; central 1 includes Kalangala, Masaka, Mpigi, Rakai, Sembabule, and Wakiso; Central 2 includes Kayunga, Kiboga, Luwero, Mubende, Mukono, and Nakasongola; East Central includes Jinja, Iganga, Kamuli, Bugiri, and Mayuge.

Table 1: Official poverty headcounts 2002-12

	2002/03	2005/06	2009/10	2012/13
Uganda	38.8	31.1	24.5	19.5
Urban	14.4	13.7	9.1	9.6
Rural	42.7	34.2	27.2	22.4
Central	22.3	16.4	10.7	5.1
Eastern	46.0	35.9	24.3	24.1
Northern	63.0	60.7	46.2	43.7
Western	32.9	20.5	21.8	7.6
Kampala	4.7	4.4	3.9	0.8
Central 1	22.0	18.8	11.1	3.9
Central 2	30.0	19.7	13.6	7.9
East Central	42.6	32.7	21.4	24.1
Eastern	48.4	39.2	26.5	24.1
Mid-northern	57.4	61.1	40.4	35.6
Northeastern	82.8	79.3	75.8	74.5
West Nile	62.8	55.3	39.7	42.0
Mid-western	37.9	23.2	25.3	9.5
Southwestern	29.0	18.7	18.4	5.8

Source: Figures are calculated from the respective UNHS.

This view is shared among many publicists and opinion makers in Uganda. Byekwaso (2010) calls officially reported poverty changes "a fiction." Kakande (2010) admits that qualitative findings on poverty trends suggest there was a decrease in well-being despite the drop in poverty rates. Recently, an unpublished manuscript has been circulating that compares Uganda to other African countries on six non-monetary poverty indicators, such as literacy rates and access to piped water. This admittedly partial analysis also points to a much higher incidence of poverty than officially reported.

3 Utility-consistent poverty lines using revealed preferences

From the above, we learn that one of the main weaknesses of the official poverty measures is that they are based on a poverty line that is constructed using a single food commodity bundle for the entire country. In addition, this food basket was constructed in 1993 and has not been updated since, apart from accounting for simple inflation by the consumer price index. However, it is well known that in many instances - for example, if relative prices of basic commodities vary by region (or through time) and preferences permit substitution - the use of a single consumption bundle may yield inconsistent poverty comparisons (Tarp et al. 2002). While differences in prices in different locations are usually incorporated in poverty measurement by adjusting the welfare indicator to reflect prices used in the construction of the poverty lines (or by adjusting the poverty lines to reflect prices used in the construction of the welfare indicator), it is becoming more and more common to also account for spatial heterogeneity in consumption bundles in an effort to increase the *specificity* of poverty lines (e.g. Ravallion and Lokshin 2006; Mukherjee and Benson 2003).

While differences in consumption baskets are interesting in their own right, they become relevant only in the context of poverty measurement and

analysis, as we relate a welfare indicator to the cost of these basic needs. Indeed, different diets may provide the same basic needs (usually a given amount of kilo-calories per day) at significantly different costs, which complicates poverty comparisons between units (regions, households, individuals, and so forth) with different diets. It is especially in this regard that Uganda provides an interesting study. Matooke, the main ingredient in the diet of households in the west, may be more or less expensive per energy unit than, for example, sorghum, the main staple in the north. As such, it would be misleading to compare the west with the north on the basis of a single food poverty line, even after allowing for spatial price heterogeneity.

But how can we be sure that two different consumption bundles provide the same basic needs? Or, in the language of Ravallion and Bidani (1994), how do we ensure *consistency*[6]? The theory underlying absolute poverty lines is grounded in welfare economics and constrained utility maximization. In this context, the fixed standard of living represented by the poverty line is viewed as a level of utility associated with the minimally acceptable standard of living. Different poverty lines will be utility-consistent if the underlying bundles of goods are on the Hicksian utility-compensated demand functions and hence yield the same level of utility (Arndt and Simler 2010). In other words, two bundles of goods are consistent if they yield the same utility. As Ravallion and Lokshin (2006) argue, the theory of revealed preferences provides a framework for answering these questions.

The idea uses the rationality assumption that economic agents that derive utility from consumption always prefer consuming more to less. Let us assume that a representative agent living in spatial domain ($r \in R$) derives utility from a set of consumption goods ($i \in I$). We will then instruct each representative consumer in each spatial domain r to spend a minimum to attain an arbitrary (but constant across spatial domains) level of utility. As

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[6]A poverty measure is consistent if two individuals at the same welfare level are considered equally poor.

such, each individual will spend $\sum p_{i,r} q_{i,r}$ on a consumption bundle, with $p_{i,r}$ the price of good i in spatial domain r and $q_{i,r}$ the quantity of good i in spatial domain r. Revealed preference conditions will then imply that

$$\sum p_{i,r} q_{i,r'} \geq \sum p_{i,r} q_{i,r} \ \forall r, r'. \tag{1}$$

This is so because the representative consumer in spatial domain r will choose only that bundle that minimizes expenditure. Thus, any other bundle that yields the same level of utility (such as, for instance, the one chosen by the representative consumer in region r') should be equally expensive as or more expensive than the chosen bundle. No bundle can cost less than the chosen one yet yield that same utility, because then the rational consumer should have chosen that one. Or, as in Gibson and Rozelle (2003), if the cost of a bundle from another domain would be cheaper if bought in a specific domain, this means it must have lower utility than the bundle in that specific domain, as otherwise the rational consumer would have picked the bundle from the other domain. The above condition (1) should hold for all possible pairs of spatial domains.

In practice, however, it will be hard to construct a set of poverty lines that meet revealed preference conditions for all possible pairs of spatial domains. One approach, which we will use in this paper, uses a minimum cross-entropy approach to adjust expenditure shares such that they meet revealed preference conditions (Arndt and Simler 2010). This approach uses the expenditure shares of the original bundles as prior information (in the form of probabilities that an arbitrarily small amount of money will be devoted to the purchase of the particular good) and the revealed preference conditions as constraints on the values that the parameters can take. The end result will be a set of adjusted expenditure shares that are as close as possible to the original shares, yet that obey a minimal set of conditions such that the estimated bundles are consistent with some arbitrary unknown preference set.

4 A reassessment of poverty in Uganda

In this reassessment of poverty in Uganda, we will mainly work with the four waves of the Uganda National Panel Survey (UNPS). The UNPS is a multi-topic panel household survey started by UBOS in 2009/10. However, the 2009/10 sample was essentially a subset of 3,123 households that were interviewed as part of the 2005/06 Uganda National Household Survey (UNHS 2005/06), a nationally representative survey that covered 6,775 households. As such, the first wave of the panel comprises the UNHS 2005/06 data of this subsample of 3,123 households. After the second wave of 2009/10, the survey was repeated annually. Currently data are available for a third round covering the 2010/11 agricultural year and a fourth round covering the 2011/12 agricultural year.[7] The UNPS is conducted in two visits to better capture agricultural outcomes associated with the two cropping seasons of the country. More information about the UNPS can be found in UBOS (2010).

For the construction of the utility-consistent poverty thresholds elaborated on in the previous section, we will use the 2012/13 Uganda National Household Survey (UNHS 2012/13). Just as the UNHS 2005/06, the UNHS 2012/13 is nationally representative, this time covering 6,888 households. We choose this survey because it is the most recent one available, and the construction of utility-consistent poverty lines requires a sufficiently large sample, with sufficient observations in each spatial domain. The larger dataset allows us to experiment with different degrees of spatial disaggregation for the domains. It also allows us to define poverty lines at a more disaggregated level than the maximum level of disaggregation for which the UNPS is deemed representative.[8] Our baseline case will look at poverty measures based on a single national poverty line using a single spatial domain, as this would be close to simply updating the current official poverty line. This will then be compared to an analysis based on six separate spatial domains

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[7]No UNPS survey has been done in 2012/13.

[8]The UNPS is representative only up to the regional level.

(Kampala, Rural central, Rural East, Rural North, Rural West, and Other Urban).

More specifically, following Arndt and Simler (2010), we start by constructing food bundles in each spatial domain. In each domain, a basket of food products that satisfies basic calorie needs is identified using information on the age and sex composition of the households and the recorded consumption patterns of poorer households.[9] The cost of this basket, valued at prices prevailing within each spatial domain, results in a set of food poverty lines, one in each spatial domain. non-food poverty lines are obtained by calculating the share of food expenditures for households whose total food and non-food consumption per capita is near the food poverty line. Total poverty lines are obtained as the sum of the food and the non-food poverty lines. These poverty lines are then compared, to make sure that they are utility-consistent. In particular, we compare the cost of a bundle in one spatial domain to the bundles in the other spatial domains, but evaluated at the price in this spatial domain. As stated above, revealed preferences states that the cost of the bundle in the spatial domain should be smaller or equal to the bundles chosen in any other spatial domain. If this condition is violated, we use a minimum cross-entropy framework to adjust consumption shares in such a way that revealed preference conditions are satisfied.

It can be instructive to have a closer look at the poverty lines. After all, poverty lines are not only useful to separate the rich from the poor, but also serve as deflators for cost-of-living differences, permitting interpersonal welfare comparisons when the cost of acquiring basic needs varies over time or space (Ravallion 1998). Table 2 reports the utility-consistent poverty lines we estimate using the 2012/13 UNHS based on the six different spatial domains.[10] The cost of living seems to be highest in the central region.

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[9]The demographic structure of each region is mapped to an average basic calorie requirement in each region using WHO (1985). The mapping from these basic caloric needs into basic needs consumption bundles is based on FAO (1986).

[10]The poverty lines in Table 2 are aggregated to different spatial domains for the sake of

The Western region comes in second. This is consistent with the findings of Appleton (2003) and Jamal (1998) and is caused by the low energy content and relatively high price of matooke, a staple grown and consumed mostly in the western and central regions. Households in the eastern region, on the other hand, consume a lot of cassava, mostly in dried or flour form, which is only three times as costly but more than eight times as nutritious. While the 2012/13 poverty lines are directly derived from the 2012/13 UNHS, the poverty lines for the other years are simply deflated using the Consumer Price Index. Poverty lines are expressed in Ugandan shillings per person per day.

Let us now look at the evolution of poverty during the recent past. We will present two sets of results. The first set of results, reported in Table 3, uses only one spatial domain. In other words, we estimate a single national poverty line based on a single national food basket.[11] We do this because, in a way, this would be the closest to simply updating the official poverty line, that is based on one single national consumption basket. Second, we will present results for an analysis that uses the six spatial domains mentioned above (Kampala, Rural Central, Rural East, Rural North, Rural West, and Other Urban). The results are reported in Table 4.

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comparison to official statistics. The underlying poverty lines for the six spatial domains, in addition to a poverty line using only one (national) spatial domain for comparison, are presented in Table A.1 in the appendix. It is not possible to directly compare the utility-consistent poverty lines we estimate to the official poverty lines, since spatial price differences are not reflected in the poverty lines. Instead, the official poverty measures incorporate spatial price difference by adjusting the welfare indicator.

[11]This national poverty line was estimated to be 1233.42, see first row in Table A.1 in the appendix. One may be surprised that the poverty line based on a single spatial domain is so low, and below all of the other poverty lines estimated in the six regions, instead of somewhere in between. This is because, using only one spatial domain essentially means that a single poverty line is constructed based on the lowest cost and lowest consuming rural zones. This leads to a low poverty line, closer to the lowest poverty line using different spatial domains (eastern region) than to the highest poverty line (Kampala). The fact that the poverty line using one spatial domain is actually below the lowest poverty line when different spatial domains are used is due to the utility consistency adjustments. Poverty lines for the central and eastern regions are significantly adjusted upward, lifting them above the poverty line using a single spatial domain.

Table 2: Utility-consistent poverty lines based on UNHS 2012/13

	2005/06	2009/10	2010/11	2011/12	2012/13
Uganda	929.34	1338.13	1425.52	1760.93	1860.54
Rural	901.93	1298.66	1383.47	1708.99	1805.66
Urban	1024.69	1475.43	1571.78	1941.61	2051.44
Central	1048.57	1509.80	1608.40	1986.84	2099.23
Eastern	798.40	1149.59	1224.66	1512.81	1598.39
Northern	914.35	1316.54	1402.52	1732.52	1830.52
Western	975.27	1404.26	1495.96	1847.95	1952.49
Kampala	1262.39	1817.68	1936.38	2392.00	2527.30
Central 1	1013.24	1458.94	1554.21	1919.91	2028.51
Central 2	1020.24	1469.02	1564.95	1933.17	2042.53
East Central	803.39	1156.78	1232.33	1522.28	1608.39
Eastern	794.83	1144.45	1219.19	1506.05	1591.25
Mid-northern	917.31	1320.81	1407.07	1738.14	1836.46
Northeastern	911.04	1311.78	1397.45	1726.26	1823.91
West Nile	910.74	1311.34	1396.98	1725.68	1823.30
Mid-western	975.58	1404.72	1496.45	1848.55	1953.12
Southwestern	974.96	1403.82	1495.50	1847.38	1951.88

Source: Figures are calculated from the respective UNHS 2012/13.

Table 3: Poverty headcounts 2002-2012 using one spatial domain

	2005/06		2009/10		2010/11		2011/12		2012/13	
	P0	contr	P0	contr	P0	contr	P0	contr	P0	contr
Uganda	0.216	1.000	0.200	1.000	0.207	1.000	0.157	1.000	0.136	1.000
Rural	0.250	0.965	0.229	0.963	0.232	0.962	0.179	0.951	0.159	0.900
Urban	0.046	0.035	0.047	0.037	0.056	0.038	0.045	0.049	0.060	0.100
Central	0.103	0.148	0.082	0.127	0.048	0.059	0.022	0.031	0.024	0.046
Eastern	0.223	0.257	0.200	0.244	0.248	0.321	0.186	0.379	0.165	0.352
Northern	0.488	0.390	0.385	0.346	0.300	0.335	0.286	0.382	0.336	0.512
Western	0.164	0.205	0.212	0.283	0.240	0.285	0.129	0.207	0.051	0.090

Source: Figures are calculated from the respective UNHS and UNPS waves.
Note: P0 means headcount poverty, contr means contribution to national
poverty.

Poverty headcounts using one spatial domain as reported in Table 3 are much lower than the official headcounts reported in Table 1. For instance, the national estimate in 2005/06 is about 10 percentage points lower than the official estimates. However, the reduction in poverty between 2005/06 and 2009/10 (7.4 per cent) is much smaller than in the official figures (more than 20 per cent). There is a slight increase in poverty in 2010/11, but national headcount poverty falls to about 16 per cent in 2011/12.[12] Overall, the reduction in poverty between 2005/06 and 2012/13 was about the same as in the official figures at around 37 per cent, most of this coming about in the two last years of the panel. The spatial patterns are the same, as both these and the official estimates are based on a single poverty line.

The national poverty headcounts are much higher than the official ones if

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[12]While part of the increase in 2010/11 is likely caused by the increase in food prices, data problems provide an additional explanation. For instance, simple counts of how many households report consuming a particular commodity point to some severe problems. In 2010/11 only about 300 household report consuming sweet potatoes, while this is around 1,400 in the other rounds. For cassava, in 2010/11 only 562 household report consumption, versus again about 1,400 in all other rounds of the UNPS.

we use six spatial domains (Table 4). While Daniels and Minot (2014) argue that the original 1993 poverty lines may have increased too little to keep pace with inflation and that differences in the measurement of consumption may contribute to the underestimation of poverty, we find that consumption bundle aggregation also seems to depress poverty figures. The reductions in poverty also seem more modest than the official ones, with an overall reduction in poverty between 2005/06 and 2012/13 of about one quarter. We also see that the largest reduction the number of people living below the poverty line happened between 2011/12 and 2012/13. However, if we look at the evolution of the poverty gap (as reported in Table A.2 in the Appendix), the largest reduction is between 2010/11 and 2011/12. This suggests quite some mobility below the poverty line between 2010/11 and 2011/12.

If we disaggregate between rural and urban poverty, we see that most of the poverty reduction has been happening in rural areas. Over the years, poverty in rural areas has steadily fallen from almost 50 per cent to 36 per cent. This is different from what has been happening in urban areas. While between 2005/06 and 2010/11 urban poverty was on the decline, it started rising again afterwards. A marked acceleration in urban poverty between 2011/12 and 2012/13 together with a steady decline in rural poverty reduced the contribution of rural poverty to overall poverty from about 94 per cent to 88 per cent in 2012/13. The evolution of official figures is in line with our findings, except that we find a much stronger rebound of urban poverty.

Finally, we disaggregate poverty by region. We find that in the Northern region, which is the poorest, poverty has decreased by 15 per cent over the entire period. However, the evolution was far from linear. Especially between 2009/10 and 2010/11, there was a strong reduction in poverty. But since then, poverty in the northern region has been rising again. The tables in the appendix show that, especially in 2012/13, not only headcount poverty but also the poverty gap and the severity of poverty has been increasing. Official poverty figures report a reduction of 28 per cent between 2005/06

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and 2012/13 in headcount poverty, very close to what we find using only one spatial domain (figure 3). The western region is, just as in the official estimates, the second richest region. However, it is now 55 per cent poorer than the richest region. This gap between the western and central regions is significantly larger than in the official statistics, where poverty rates in the western region are 33 per cent higher than in the eastern region. Thus, while we do not observe the changes in the rankings observed by Appleton (2003), our results are consistent with the finding that the west is poorer than official figures suggest.

The central region, already the least poor region at the start of the panel, reduced headcount poverty by half between 2005/06 and 2012/13 according to our estimates using six spatial domains. Again, official estimates record higher poverty reductions (almost 70 per cent), which is again similar to what we find in our estimates using only one spatial domain. Inequality in poverty headcount has also increased over time. While the northern region initially contributed 27 per cent to overall poverty, this has increased to 37 per cent in 2012/13. The contribution of the eastern region also has increased substantially. And while severity of poverty has reduced in the northern region, in 2012/13, almost 60 per cent of the national severity of poverty measure was contributed by the North. If we disaggregate the 2012/13 data further, we find that most poverty is found in the northeast, where over 80 per cent of the individuals live in poverty. This is followed by West Nile, a distant second with 60 per cent of the population living in poverty.

To summarize, we feel that the poverty measures and the evolution of poverty over time are much more credible, both from a theoretical and an empirical point of view. The continued use of outdated poverty lines based on a single food basket is likely to lead to inconsistent poverty estimates, especially in a country where different regions have widely varying diets. Indeed, most of the staples in these diets are effectively non-tradables, deriving their price from local demand and supply conditions. The result is that the cost of

Table 4: Poverty headcounts 2002-2012 using six spatial domains

| | 2005/06 | | 2009/10 | | 2010/11 | | 2011/12 | | 2012/13 | |
	P0	contr	P0	contr	P0	contr	P0	contr	P0	contr
Uganda	0.423	1.000	0.381	1.000	0.370	1.000	0.359	1.000	0.315	1.000
Rural	0.476	0.938	0.431	0.951	0.413	0.959	0.408	0.943	0.360	0.879
Urban	0.158	0.062	0.117	0.049	0.108	0.041	0.121	0.057	0.167	0.121
central	0.291	0.213	0.231	0.187	0.143	0.098	0.146	0.089	0.149	0.123
Eastern	0.374	0.219	0.295	0.188	0.389	0.282	0.379	0.337	0.355	0.328
Northern	0.670	0.273	0.603	0.285	0.489	0.306	0.529	0.308	0.567	0.374
Western	0.463	0.295	0.485	0.340	0.473	0.314	0.379	0.266	0.231	0.175

Source: Figures are calculated from the respective UNHS and UNPS waves.
Note: P0 means headcount poverty, contr means contribution to national
poverty.

basic needs, even though anchored in a single caloric requirement, may vary
significantly. We also feel that the poverty levels, as well as the estimated
reduction in poverty, are closer to what other researchers have deemed more
realistic.

5   A profile based on poverty dynamics

Now that we developed a new set of poverty lines above, in this section, we
will use the Uganda National Panel to construct profiles for different cate-
gories of households based on the evolution of their poverty status over time.
We will start by defining five different categories. The first category consists
of households that are identified as being poor in all four waves of the UNPS.
We will refer to these households as the *chronic* poor. Second, we will identify
the households that were never poor in any of the waves. These households
will be grouped in the *non-poor* group. Next, we delineate a group of house-
holds that are *escaping* poverty. These are households that are poor in all

past waves but non-poor in all subsequent waves.[13] A fourth group will then consist of those households that are *falling* into poverty. These are households that are non-poor in all past waves but poor in all subsequent waves.[14] Finally, there is a category for the rest. These households, repeatedly moving in and out of poverty, are labeled as *vulnerable* in our analysis.

Looking at poverty transitions using the above typology, we find that only about 257 of the 2,195 households that appear in all four waves are poor in each wave. This amounts to only 11.7 per cent of the households being chronic poor. However, if we weigh these households by population weights, the number of chronic poor individuals increases to 12.3 per cent. This suggests that the chronic poor tend to live in larger households. At the other extreme, we find that 833 households, or 37.9 per cent of the households, are never poor, corresponding to about 35.8 per cent when using weights. Next, 387 households have escaped poverty and 198 have fallen into poverty, corresponding to 19.0 and 8.2 per cent of the population, respectively. Finally, there is a sizable class of about 520 vulnerable households, or almost a quarter of the population, that moves into or out of poverty, possibly multiple times, over the four waves.

We will now relate these four categories of households to various household characteristics to come up with a profile, similar to poverty profiles in a static analysis of poverty. Since we are interested in the likely causes of poverty transitions (as opposed to the likely consequences of poverty transitions), we will look at characteristics of the household at the first wave of the panel in 2005/06. In other words, the profile will help us understand why

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[13]This group comprises households that are poor in 2005/06 and non-poor in all subsequent rounds, those that are poor in 2005/06 and 2009/10 and non-poor in 2010/11 and 2011/12, and those that are poor in 2005/06, 2009/10 and 2010/11 and non-poor in 2011/12.

[14]This group comprises households that are non-poor in 2005/06 and poor in all subsequent rounds, those that are non-poor in 2005/06 and 2009/10 and poor in 2010/11 and 2011/12, and those that are non-poor in 2005/06, 2009/10 and 2010/11 and poor in 2011/12.

households have fared differently in terms of poverty status because of a different past. As such, we will also concentrate on characteristics that change only slowly over time, as opposed to those that may change significantly from year to year, such as crops cultivated. In a way, we want to identify the preconditions at the household level associated with different poverty transition trajectories.

5.1 Location

Location and well-being are often found to be correlated. In virtually all cases, poverty is found to be higher in rural areas than in urban. More in general, remote areas tend to be poorer for a myriad of reasons. For instance, one prominent economic reason is that in sparsely populated areas with a thin road network that is often in bad shape, transaction costs are high, affecting economic activity (Stifel and Minten 2008). Dercon, Hoddinott, and Woldehanna (2012) find that chronic poverty in Ethiopia is significantly correlated to 'remoteness' in terms of distance to town or poor roads. But Bird, McKay, and Shinyekwa (2010) note that agro-ecology; institutional, political, and governance failures; service delivery; stigma and exclusion; crime and insecurity; and communication, media, and information and communication technologies are all factors that are mediated by remoteness and as such likely to contribute to special poverty traps.

We first look at the location of households in the five classes in terms of being in urban or rural areas. Of all the chronic poor, 97.7 per cent live in rural areas. Of all the non-poor, this is only 71.9 per cent. For Uganda as a whole, 86.7 per cent report to be living in rural areas. Going one step further, we look at the three groups by region. This is visualized in the mosaic plot in figure 1. The figure clearly shows that chronic poverty is concentrated in the northern region. Here, 45.5 per cent of all the chronic poor can be found. On the other end, the households that never experienced poverty are disproportionately located in the central region: More than 44 per cent of

the people that are always above the poverty threshold live there. If one lives in the eastern region, one has a relatively higher chance of falling into poverty. People living in the western region seem to be moving in and out of poverty more than people living in other regions. While the northern region has a large group of chronic poor, the good news is that the relative share of people escaping poverty is larger than the share that fall into poverty. This is different in the eastern region, where the large share of individuals sliding into poverty happens simultaneously with relatively few people escaping poverty. Finally, it is worth noting that, despite the already high presence of non-poor in the central region, many poor households have escaped poverty over time and very few households have slipped back into poverty.

As mentioned above, location also affects access to services, such as safe drinking water. Figure 2 provides kernel density plots for time reported to fetch drinking water including waiting time. You can see that respondents cluster their answers around 2 hours and 4 hours. We find that, in general, the non-poor need to spend less time fetching water, except maybe for some non-poor that spend about 2 hours. The median for the non-poor is about 50 minutes, as opposed to about 60 minutes for the chronic poor. The respective means are 63 minutes for the non-poor and 77 for the poor. This is also illustrated by the fact that the chronic poor have higher densities at the extreme right of the distribution, for instance around 4 hours, or 240 minutes. The vulnerable have a high density around 2 hours.

5.2   Household demographics

The size and composition of the household are also variables that often feature in poverty regressions. For instance, many studies find that household size is a good poverty indicator. It is thought that increased competition for a given food stock reduces consumption. However, Lanjouw and Ravallion (1995) argue that the negative correlation disappears as one takes economies of scale in household food consumption into account. In terms of production,

Figure 1: Regional poverty dynamics
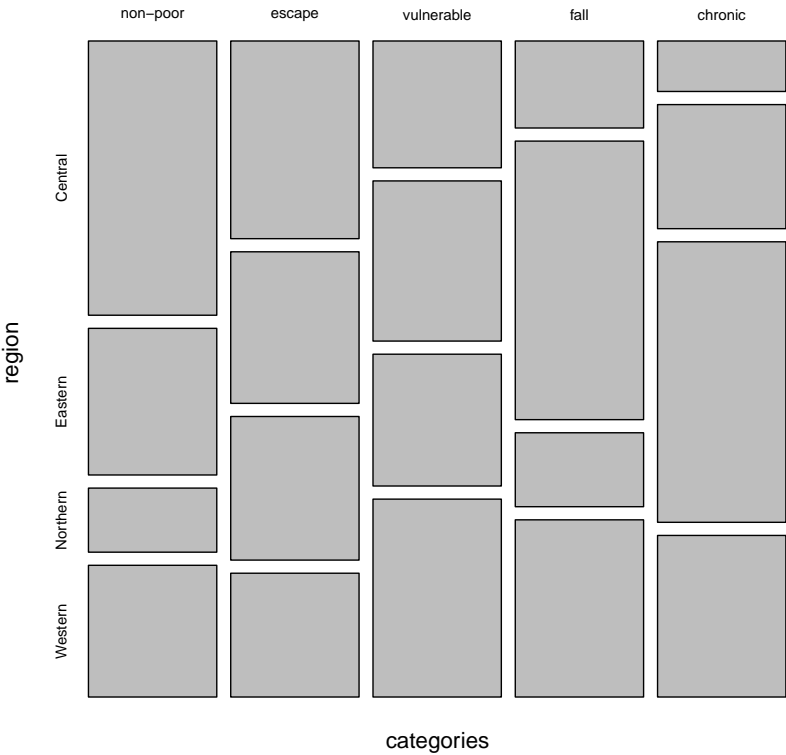
Source: Author's calculations from the UNPS.

Figure 2: Time to fetch water
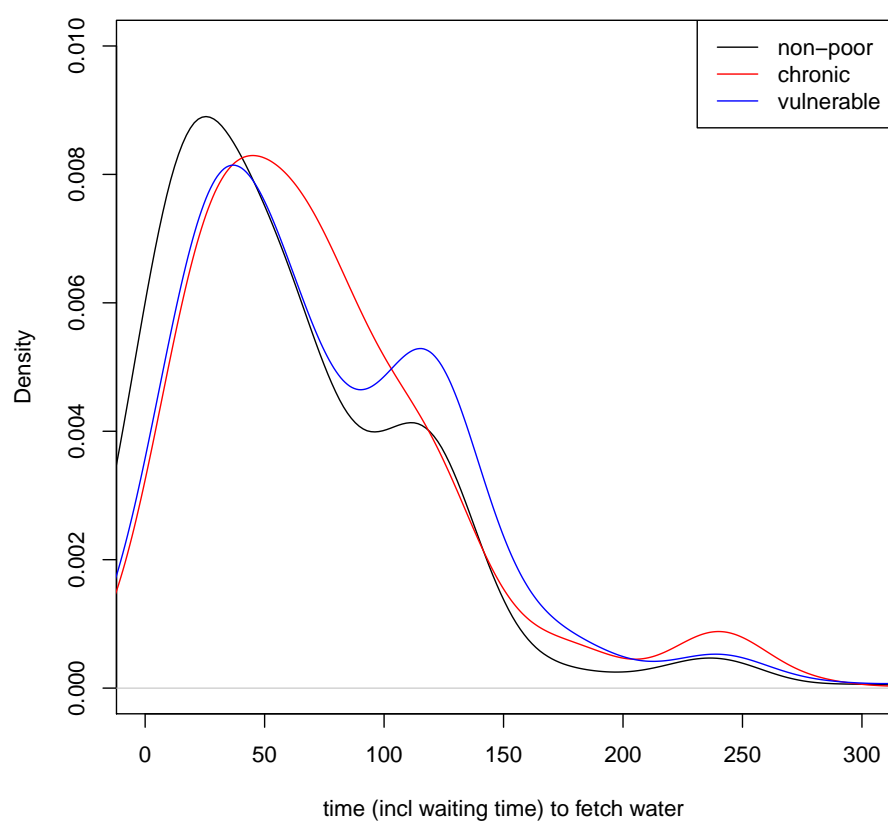
Source: Author's calculations from the UNPS.

a larger household may mean more and cheaper labor is available, but Van Campenhout (2014) finds that especially mothers in larger households devote a significant amount of time to non-productive activities. This last feature may be captured better when using relating the different types of household in terms of poverty dynamics to dependency ratios.

Female-headedness is also often found to be a good predictor of poverty. The underlying reasons should be sought in differences between male-headed and female-headed households in terms of access to secure land tenure, labor, credit, technology, and extension services (e.g. Quisumbing and Pandolfelli 2010). One of the consequences is that female-headed households employ fewer inputs, such as improved seeds and fertilizer, which has been shown to reduce productivity (e.g. Udry et al. 1995). We will also look at marital status as an alternative way to look at gender-based agricultural gaps. This will enable us to see if, for instance, widowhood is associated with chronic poverty (van de Walle 2013).

We find that indeed, chronic poor households are more likely to be headed by a female. In addition, households that were never poor in our panel, as well as households that are escaping poverty over time, are more likely to be headed by a male. For the other categories, we do not find big differences between male- and female-headed households. We also looked at the age of the household head. We find that average age of the household head is around 40 for households that are chronic poor or have been sliding into poverty. Households that have never been poor or that have moved out of poverty are on average about 4 years older.

Figure 3 gives an idea of the distribution household size and child dependency ratios conditional on the poverty dynamics group of the household. In the left panel (1), we plot box plots for household size for each of the five poverty dynamics classes. In the right panel (2) we do the same for child dependency ratios. For each household we calculate the share of children under the age of 15 within the total household and use this to plot box plots

by poverty dynamics category. We find that higher child dependency is associated with chronic poverty, while the non-poor have the lowest median child dependency ratio. Looking at both of the charts together, the chronic poor have relatively large households and high dependency ratios. Those that are never poor have small households and low dependency ratios. Households that slide below the poverty threshold and those that are vulnerable have a surprisingly high dependency ratio given the relatively smaller households. These may be households where one of the parents has died or has left the household. Large households with a high dependency ratio also escape poverty. These may be households that start to benefit from the additional cheap labor provided by children.

For marital status of the household head, respondents could choose from five mutually exclusive types of marriage: married monogamously, married polygamously, divorced, widow or widower, and never married. The results are presented as a table of proportions where the rows sum to 1 (Table 5). This allows us to judge the fraction of the total in each type of marriage accounted for by each of our poverty transition groups. Thus, although the chronic poor account for only about 12.3 per cent of the population, they account for almost 20 per cent of individuals living in households where the head has never been married. However, at the same time, households where the head is never married are clearly more likely to be non-poor, as are households where the head has divorced. We also see that widowed households are underrepresented in the non-poor segment. In addition, households headed by widows appear to have a hard time keeping consumption smooth, as is evident by the large proportion classified as vulnerable. Divorced household heads have been more successful in moving out of poverty and are underrepresented in the group of chronic poor households. Polygamously married households have been less successful in escaping poverty. Just as widowed household heads, they seem to have a hard time keeping consumption smooth between the different years.

Figure 3: Household size and child dependency ratios
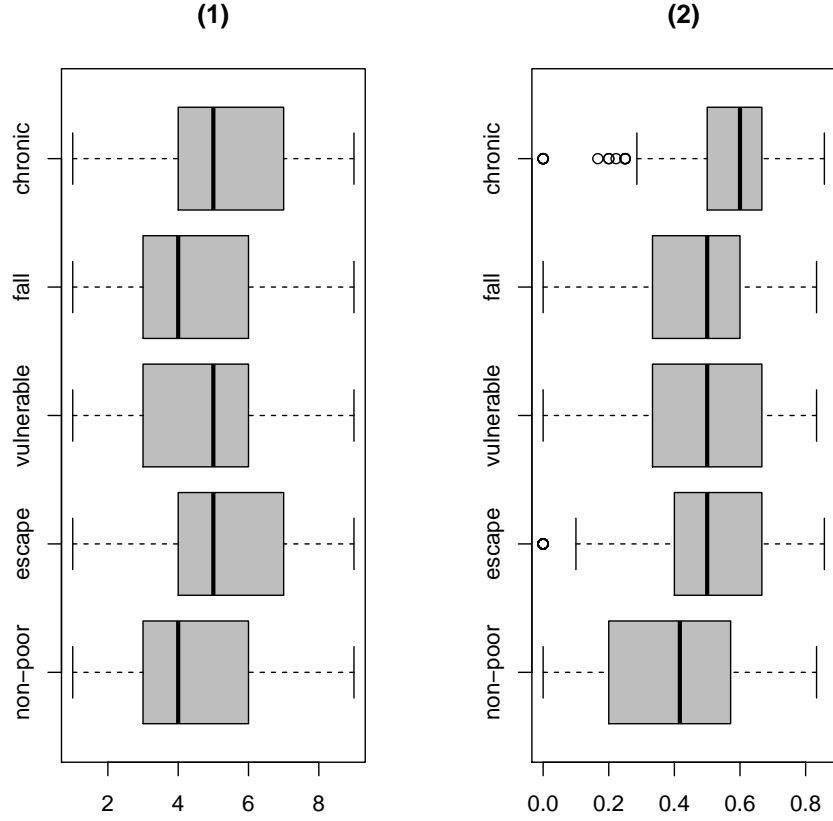
Source: Author's calculations from the UNPS.

Table 5: Marital status

	Non-poor	Escape	Vulnerable	Fall	Chronic
Married monogamously	0.367	0.192	0.230	0.086	0.125
Married polygamously	0.348	0.152	0.299	0.081	0.119
Divorced	0.420	0.238	0.169	0.077	0.096
Widowed	0.272	0.246	0.293	0.071	0.118
Never married	0.517	0.125	0.139	0.029	0.190
All	0.358	0.190	0.247	0.082	0.123

Source: Author's calculations from the different waves of the UNPS.

Table 6: Most important source of earnings

	Non-poor	escape	vulnerable	fall	chronic
Subsistence farming	0.257	0.211	0.293	0.089	0.150
Commercial farming	0.563	0.160	0.258	0.019	0.000
Wage employment	0.513	0.145	0.152	0.094	0.097
Non-agricultural enterprises	0.535	0.159	0.160	0.060	0.086
Property income	0.865	0.035	0.037	0.064	0.000
Transfers	0.555	0.207	0.168	0.048	0.021
Organizational support	0.172	0.132	0.290	0.057	0.349
All	0.358	0.190	0.247	0.082	0.123

Source: Author's calculations from the different waves of the UNPS.

5.3 Activity

Table 6 looks at what households report to be their major source of earnings at the beginning of the panel. While in general 35.8 per cent of Ugandans fall in the non-poor category, only 25.7 per cent of the Ugandan subsistence farmers are in the non-poor subgroup. It seems the group of vulnerable households is disproportionately represented within the group of subsistence farmers. Subsistence farming is indeed a very risky activity, and subsistence farmers have few assets to insure against adverse shocks such as bad weather outcomes or disease. Individuals that are living in households that report to be engaged in commercial farming appear more likely to be non-poor. Wage employment also seems to be an activity that is prevalent among the non-poor. But among the wage employed, there is also an over-representation in the group of people that have fallen into poverty.

Ugandans engaged in nonagricultural enterprises are also likely to fall into the non-poor category. The most clear results are for those who mention their main source of income is property - virtually all are non-poor. People that depend on transfers are also non-poor. Transfers are likely to correlate with social capital, and hence the lower probability that households fall into the vulnerable group or in the group that falls into poverty. Finally, a significant

group of people reported to be depending on handouts. As expected, these are especially the chronic poor or individuals that are vulnerable. It is, however, also interesting to note that 17.2 per cent of the individuals that report organizational support as their main source of income are never poor in the four-wave panel.

5.4 Education

In traditional poverty profiles, the education level of the household head is often significant. Indeed, skills are important for the self-employed, and schooled labor is likely to be better rewarded. It is less obvious how schooling affects poverty dynamics in the short run. Lack of education has been linked to intergenerational poverty (Harper, Marcus, and Moore 2003). Education is also among the initial characteristics associated with chronic poverty in rural communities in Ethiopia (Dercon, Hoddinott, and Woldehanna 2012).

Table 7 looks at the highest education level reported by the household head. We see that 17.6 per cent of all Ugandan household heads have never attended school. However, within the group of individuals in households that have always been poor, the share of households that are headed by someone without formal education is 37 per cent. On the other hand, the share of household with heads without schooling in the subgroup of the non-poor is only 7.8 per cent. In the second row, we see that the majority of household heads have finished primary eduction. Primary education also seems insufficient to keep the household permanently out of poverty. Everything above primary education leads to a higher-than-average chance to be in the non-poor class.

5.5 Health

Illness and health shocks have been reported to affect poverty dynamics. For instance, Barrett et al. (2006) note that serious human health shocks causing

Table 7: Education of household head						
	non-poor	Escape	Vulnerable	Fall	Chronic	All
No schooling	0.078	0.190	0.227	0.142	0.366	0.176
Primary	0.425	0.648	0.627	0.642	0.583	0.554
Post-primary training/certificate	0.085	0.026	0.024	0.032	0.010	0.045
Secondary	0.297	0.119	0.114	0.175	0.041	0.177
Post-secondary training/certificate	0.086	0.016	0.006	0.009	0.000	0.036
Above	0.029	0.000	0.002	0.000	0.000	0.011

Source: Author's calculations from the different waves of the UNPS.

permanent injury or illness or death were among the most frequently cited reasons for households falling into poverty in quantitative data from Madagascar and Kenya. But the bidirectional nature of the poverty relationship between poverty and health may trap households in persistent poverty, as ill health can be a catalyst for poverty spirals and in turn poverty can create and perpetuate poor health status (Grant 2005).

Health status is likely to be a function of the distance the nearest health facility. Figure 4 reports on distance to nearest health facility. By health facility we mean either a private clinic, a government or non-governmental health unit or hospital. There seems to be some pattern in the data. Households that are never poor in any of the waves of the panel dataset reported lowest median distance to health facilities. At the other extreme, we find that households that live in chronic poverty reported highest median distance to health facilities. Distance to health facilities likely reflects location, as we have seen that the chronic poor tend to live in more remote areas.

Figure 5 looks at average days that household heads reported being inactive due to illness in the last six months in the 2005/06 UNPS wave conditional on subsequent poverty transitions. For most of the categories, the number of days lost is on average about 8.5 days. We see that people that have lost relatively few days due to illness are more likely to be in the subgroup that subsequently escapes poverty. On the other hand, the households that report the highest number of days lost by the household head due to illness are those that are in the subgroup of households that eventually fall into poverty or are living in chronic poverty.

5.6 Shocks and Coping

The poor are known to be more vulnerable to shocks, due to their lower ability to insure (Dercon 2004). Shocks can have lasting effects if they destroy productive assets, such as when droughts reduce livestock, or health shocks that destroy human capital. If households are left with too few productive

Figure 4: Distance to health infrastructure
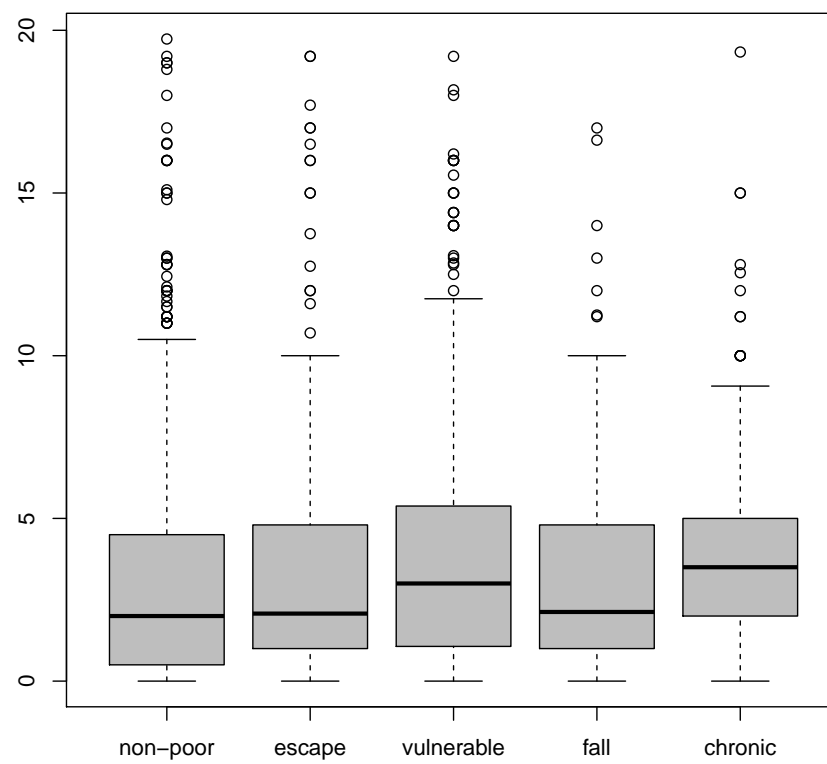
Source: Author's calculations from the UNPS.

Figure 5: Days inactive
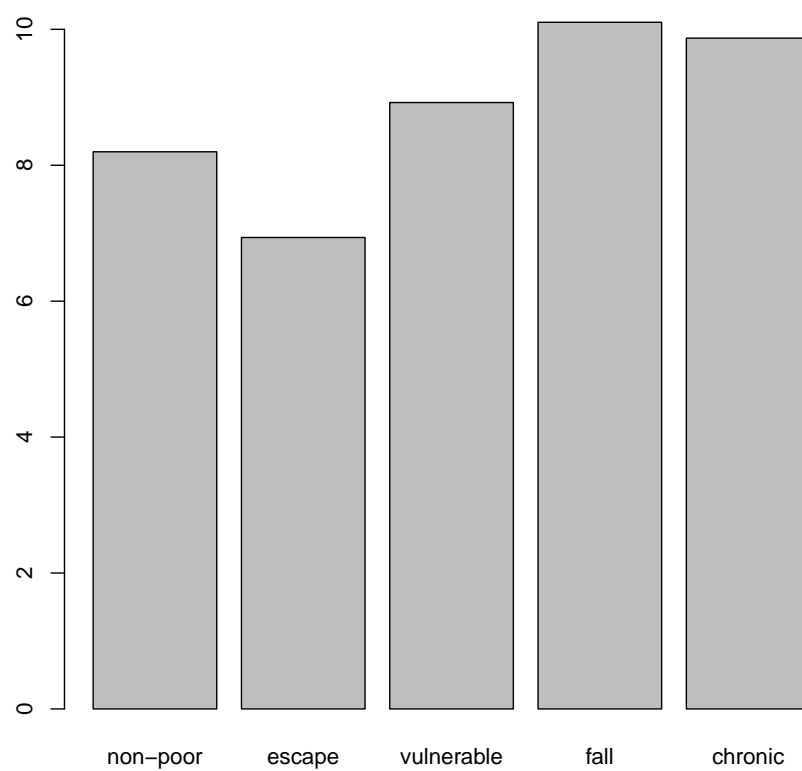
Source: Author's calculations from the UNPS.

assets to replenish the gap left by shocks, they are likely to fall into an asset-based poverty trap (Carter and Barrett 2006). We also look at how the households deal with shocks ex post conditional on their wealth dynamics category.

Table 8 look at shocks reported at the onset of the panel. We again report column percentages. Hence, while 35 per cent of all shocks are drought related, this increases to almost 40 per cent in the group of the chronic poor. Still, drought also features prominently in the group that subsequently escapes poverty. A substantial share of the non-poor report to have been exposed to drought shocks, but this share is only about 5 percentage points lower than the overall share that reports drought-related shocks. Floods, hailstorms, and also pest reports do not seem to differ too much between the different groups.

Bad seed quality is reported more among the non-poor than average. This may be because especially farmers that are always above the poverty line are more commercially oriented and buy seed, instead of recycling seeds. As such, they are also more prone to counterfeit seeds. But probably the most significant result in this table is the disproportionate number of people within chronically poor households that report being affected by civil strife. Poverty that is associated with civil war seems to be very persistent (Goodhand 2003). The non-poor clearly faced different shocks. They report more than average losses related to robbery and theft. This category also shows up relatively more in the category of households that slide into poverty. The death of a family member is also disproportionately mentioned among those that fall into poverty over the period covered by the panel.

Finally, the dot chart in figure 6 shows how the different categories of households reportedly dealt with shocks. The top of the chart shows that the non-poor most often used savings to cope with shocks. This is also reported as a main source of ex-post insurance for a substantial part that have slid into poverty over the course of the panel. The chronic poor deal in a completely

Table 8: Shocks

	non-poor	Escape	Vulnerable	Fall	Chronic	All
Drought	0.302	0.383	0.369	0.350	0.388	0.350
Floods/hailstorm	0.125	0.135	0.136	0.114	0.129	0.129
Pest attacks	0.098	0.086	0.084	0.098	0.082	0.090
Bad seeds quality	0.035	0.011	0.023	0.021	0.018	0.024
Livestock epidemic	0.065	0.067	0.042	0.047	0.061	0.057
Fire accident	0.018	0.021	0.036	0.024	0.038	0.027
Civil strife	0.037	0.059	0.074	0.051	0.123	0.064
Robbery/theft	0.102	0.055	0.075	0.098	0.063	0.081
Death of the head of the household	0.022	0.041	0.023	0.028	0.023	0.026
Death of other family member	0.139	0.097	0.107	0.123	0.038	0.108
Injury from accidents	0.033	0.011	0.010	0.024	0.010	0.019
Other	0.024	0.032	0.020	0.021	0.025	0.024

Source: Author's calculations from the different waves of the UNPS.

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different way with shocks. For instance, they can not rely on savings to deal with shocks. Instead, the poor seem to rely on employment and migration, but most of all simply have no choice but to reduce consumption. The graph also shows the importance of social capital to deal with shocks for vulnerable households. There is also some indication that informal borrowing during the first round of our panel is associated to an increase in the chance that households descend into poverty.

6   Conclusion

In this paper, we reassess the evolution of poverty over the past ten years in Uganda. Official figures suggest substantial poverty reduction, but independent researchers note that the benefits of economic growth have been shared unequally. In addition, casual observation does not correspond to the rosy picture that official figures suggest. Other indicators that define well-being in a broader way, such as adult literacy and maternal health, also put Uganda at a much lower level than what would correspond to the disseminated poverty levels.

One possible explanation for this divergence lies in the poverty line. The poverty line that is currently in use to estimate official poverty in Uganda was constructed more than a decade ago, using data from a 1993/1994 survey. In addition, this poverty line relies on a single food consumption basket for Uganda, despite the fact that Uganda consists of a diverse set of regions, each with their own diets. These diets are also exceptional in their difference in cost to obtain a certain level of kilo-calories (or utility of that matter). Lumping all regions together and assuming they require the same amounts of each commodity disregards the cultural and agro-climatic diversity that typifies Uganda.

We therefore follow Arndt and Simler (2010), who propose an information-theoretic approach to constructing utility-consistent poverty lines. The idea

Figure 6: Coping with adverse shocks
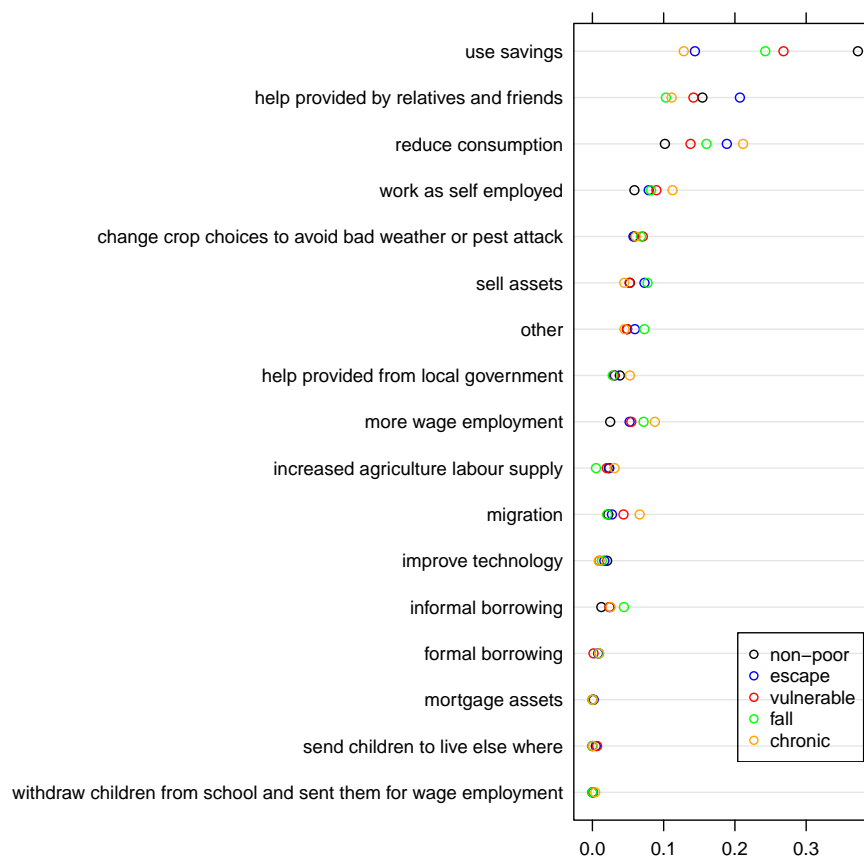
Source: Author's calculations from the UNPS.

is to construct different poverty lines by spatial (or temporal) domain that yield a minimal amount of kilo-calories given the demographic makeup of the region. These poverty lines are then tested to check if they obey revealed preference conditions. In particular, we check if the food baskets chosen in all other regions are less expensive than the food basket chosen in a particular region. If not, the individual could have chosen a cheaper basket that yields the same utility. This violates the revealed preference condition. We apply an information-theoretic approach that adjusts consumption shares such that this revealed preference condition is satisfied, while keeping the original diets intact as much as possible.

We feel that the poverty estimates using poverty lines that reflect local diets are more realistic than the official ones. For instance, they are much more in line with the levels and evolution of other non-monetary poverty indicators. A case in point is the nutritional status of children. According to the Uganda Demographic Household Survey 2011, height-for-age scores are worst in the western region, except for the Karamoja district. Ssewanyana and Kasirye (2010) also find that the highest rates of stunting are in the southwestern subregion. This at least indicates that the situation in terms of poverty is less rosy than official figures suggest.

While our analysis shows the situation has improved over time in the northern region, a disturbingly large proportion of the chronic poor remain. In addition, a substantial proportion of vulnerable households resides in the northern region. The use of utility-consistent poverty lines that are allowed to differ in terms of diet by geographic location also points to substantial poverty in the western region. The fact that in this region, relatively few households are escaping poverty and relatively more households are falling into poverty needs attention. This is in stark contrast to the central region, where, despite the already high presence of non-poor, many poor households have escaped poverty over time and very few households have slipped back into poverty.

Turning to household demographics, we find that chronic poor households are more likely to be headed by a female. In addition, households that were never poor in our panel are more likely to be headed by a male. Higher child dependency is associated with chronic poverty, while the non-poor have the lowest median child dependency ratio. Despite the relatively low household size, it now seems that the households that slide below the poverty threshold have a surprisingly high dependency ratio. These may be households where one of the parents has died or has left the household. We also see that widowed households are underrepresented in the non-poor segment. In addition, households headed by widows appear to have a hard time keeping consumption smooth, as is evident by the large proportion classified as vulnerable. Households where the head is never married are clearly more likely to be non-poor. Divorced household heads have been more successful in moving out of poverty, and they are also more likely to be non-poor. Polygamously married households have been disproportionately sliding into poverty and are also slightly more likely to be chronic poor.

If we look at the main source of income at the start of the panel, we find a significant group of people that reported to be depending on handouts. As expected, these are especially the chronic poor or individuals that fall into poverty. It seems the group of vulnerable households is disproportionately represented within the group of subsistence farmers, underlining the riskiness of rain-fed agriculture. Ugandans engaged in commercial agriculture of non-agricultural enterprises are also likely to fall into the non-poor category.

We then look at education and health. We find that households that live in chronic poverty reported highest median distance to health facilities. Distance to health facilities likely reflects location, as we have seen that the chronic poor tend to live in more remote areas. Another striking feature is that long periods of illness (in terms of days lost due to illness) are correlated with sliding into poverty. Primary education of the household head alone also seems insufficient to escape poverty in the long run. Finally, we find some

interesting results with respect to shocks and how households subsequently deal with these shocks. While the chronic poor have no other option than to reduce consumption, the non-poor draw on savings. Social networks also seem important for vulnerable households.

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Appendix

Table A.1: Utility-consistent poverty lines

	2005/06	2009/10	2010/11	2011/12	2012/13	foodshare
National	616.09	887.09	945.03	1167.38	1233.42	0.72
Kampala	1262.39	1817.68	1936.38	2392.00	2527.30	0.62
central Rural	1029.78	1482.75	1579.58	1951.24	2061.62	0.68
Eastern Rural	765.61	1102.38	1174.37	1450.68	1532.75	0.71
Northern rural	900.38	1296.43	1381.09	1706.05	1802.56	0.72
Western Rural	973.32	1401.46	1492.99	1844.27	1948.60	0.72
Other Urban	983.16	1415.62	1508.07	1862.90	1968.28	0.69

Source: Figures are calculated from the respective UNHS and UNPS waves.

Table A.2: Poverty gap 2002-2012 using six spatial domains

	2005/06		2009/10		2010/11		2011/12		2012/13	
	P1	contr	P1	contr	P1	contr	P1	contr	P1	contr
National	0.143	1.000	0.133	1.000	0.131	1.000	0.106	1.000	0.092	1.000
Rural	0.162	0.946	0.151	0.952	0.146	0.959	0.119	0.936	0.104	0.872
Urban	0.047	0.054	0.040	0.048	0.039	0.041	0.040	0.064	0.051	0.128
Central	0.092	0.198	0.077	0.177	0.050	0.096	0.031	0.064	0.032	0.092
Eastern	0.101	0.175	0.090	0.165	0.107	0.219	0.092	0.279	0.085	0.270
Northern	0.302	0.364	0.242	0.327	0.197	0.347	0.193	0.381	0.221	0.499
Western	0.139	0.262	0.165	0.331	0.179	0.337	0.116	0.276	0.053	0.139

Source: Figures are calculated from the respective UNHS and UNPS waves.

Note: P1 means poverty gap ratio, contr means contribution to national poverty.

Table A.3: Poverty severity 2002-2012 using six spatial domains

	2005/06		2009/10		2010/11		2011/12		2012/13	
	P2	contr	P2	contr	P2	contr	P2	contr	P2	contr
National	0.066	1.000	0.063	1.000	0.063	1.000	0.046	1.000	0.040	1.000
Rural	0.075	0.949	0.072	0.951	0.071	0.962	0.051	0.929	0.045	0.867
Urban	0.020	0.051	0.019	0.049	0.017	0.038	0.019	0.071	0.023	0.133
Central	0.041	0.191	0.036	0.174	0.026	0.106	0.010	0.049	0.011	0.075
Eastern	0.037	0.141	0.039	0.148	0.041	0.174	0.035	0.244	0.031	0.227
Northern	0.164	0.430	0.126	0.356	0.100	0.366	0.095	0.434	0.111	0.582
Western	0.058	0.238	0.076	0.322	0.091	0.354	0.049	0.273	0.019	0.116

Source: Figures are calculated from the respective UNHS and UNPS waves.

Note: P2 means severity of poverty measure, contr means contribution to national poverty.