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Poverty Trends and Profile – 2003-2009

A Policy Note 1

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ABBREVIATIONS AND ACRONYMS

CFA	<i>Communauté financière d'Afrique</i>
CWIQ	Core Welfare Indicator Questionnaire
EBCVM	<i>Enquête Base sur la Condition des Vie des Ménages</i>
EICVM	<i>Enquête Intégrale sur les Condition de Vie des Ménages</i>
EP	<i>Enquête Prioritaire</i>
FCFA	Franc CFA
GDP	Gross Domestic Product
HCPI	Harmonized Consumer Price Index
HDI	Human Development Index
HDRO	Human Development Report Office
INSD	Institut National de la Statistique et de la Demographie
LDC	Less Developed Countries
MDG	Millennium Development Goals
OLS	Ordinary Least Squares
SCADD	<i>Stratégie pour une Croissance Accélérée et une Développement Durable</i>
SSA	Sub-Saharan Africa
UNDP	United Nations Development Programme
WDI	World Development Institute
UNESCO	United Nations Educational, Scientific and Cultural Organization

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1. Poverty Trends and Profile for Burkina 2003-2009

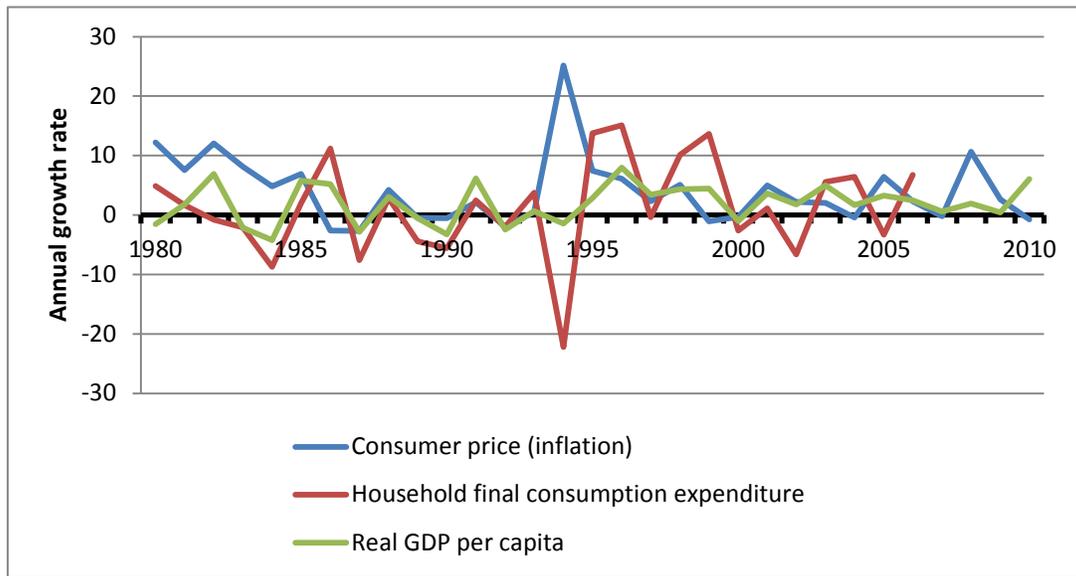
A. BRIEF BACKGROUND

1.1 **Burkina Faso's Poverty Reduction Strategies (PRS) of the 2000s, which were implemented as annually rolled-over Priority Action Programs, focused on four pillars:** (a) accelerating broad based growth; (b) expanding access to social services for the poor; (c) increasing employment and income-generating activities for the poor; and (d) promoting good governance. During the latter half of the decade and prior to the financial crisis of 2009, the country achieved a GDP growth approaching, on average, about 5 percent per year (or 2.5 percent per capita). Given these levels of growth performance, we would expect welfare outcomes to have improved. Increased public expenditure and targeted social service provision also led to improved access to basic services. In the area of education, progress has been made in terms of school infrastructure. Over the period of 2003-2008, substantial expansion (around 40 percent) of both the number of schools and the number of classrooms was achieved. Controlling and treating epidemic diseases also had good results, thanks to prevention and public awareness efforts and improved hygiene.

1.2 **Meanwhile, the country has been through several exogenous shocks and crises likely to have affected the pattern of poverty outcomes:** drought (2004, 2007), food and oil crisis (2007), financial crisis and economic downturn (2008/2009), and more recently the floods of September 2009 and July 2010 which left more than 150,000 people homeless, destroyed a number of economic and social infrastructures, estimated at more than 80 billion CFA franc. At the same time, the Burkina Faso government is currently revising its development strategy. The new strategy - *Stratégie pour une Croissance Accélérée et un Développement Durable* (SCADD) - planned for the period 2011-2015, has the main objective of promoting an accelerated and shared growth and a sustainable development.

1.3 **In the past two decades, Burkina Faso's income per capita growth has been positive and less volatile relative to the past.** Volatility in GDP per capita was more pronounced during the period between 1980 and 1994, with years of decline (negative growth) alternating with years of expansion (positive growth). In fact, the growth rate reached a peak of 6.9% in 1982 and a low of -4.2% in 1984 over this period. Since 1994 GDP per capita has been generally positive and with fewer large swings. A plausible explanation of the relatively high growth rates recorded during 1995-99 (with a peak of 8% in 1996) is the devaluation of the CFA franc which made the country's main exports – commodities – more competitive and a recovery in international prices of some primary products such as cotton. After a brief recession in 2000, the country enjoyed a sustained stretch of growth between 2001 and 2006 with an average annual increase of about 3% over the period. Growth became weaker in the years 2007 - 2009, before leaping to 6% in 2010.

Figure 1.1: Average annual growth in real per capita GDP, household consumption and consumption prices

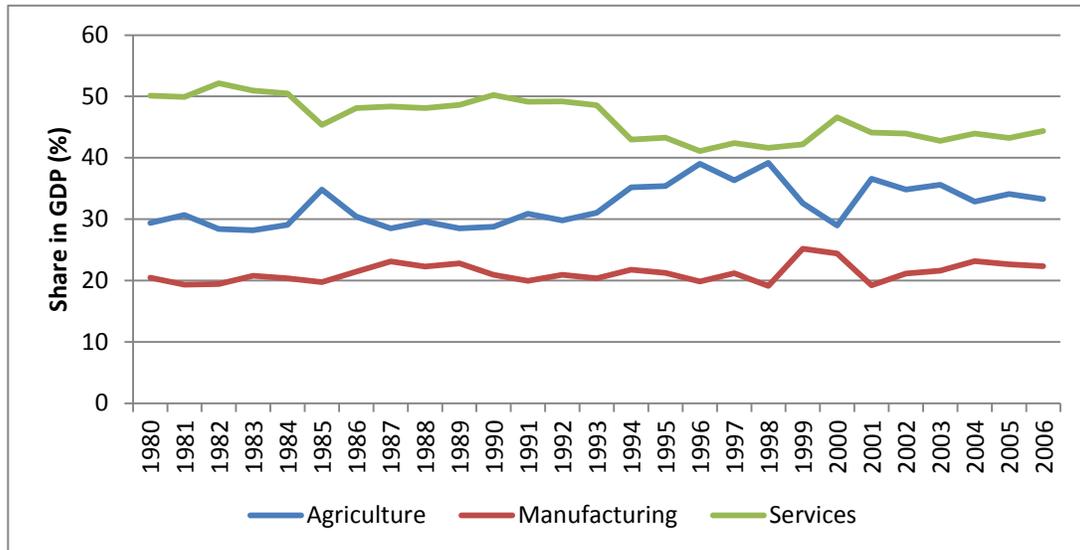


Source: WDI

1.4 **In addition, inflation has remained low for most of the last two decades in Burkina Faso, as in the other countries of the CFA franc zone (Figure 1.1).** Inflation was higher in the early 1980's, exceeding 10% in 1980 and 1982, and is suspected to have been driven by pressures in food markets. However, through most of the 1980s inflation continued to decline, and remained moderately low in the 1990s, except for the inflationary surge in 1994, following the devaluation of the CFA franc, when inflation breached 25%. Similarly, low rates were recorded in the 2000s until 2008 when consumer prices rose to about 11% due to the international economic and financial crisis.

1.5 Not surprisingly, household consumption (as measured in the national accounts) mirrored the structural changes of the last three decades. Household consumption was just as volatile as income per capita in the 1980s, but recovered substantially after the country gained competitiveness in the latter half of the 1990s following devaluation. However, since then, consumption has exhibited much more volatility than output.

Figure 1.2: Sectoral GDP trends in Burkina Faso



Source: WDI

1.6 Recent growth trends appear to be anchored by a general recovery in the primary sector. The sectoral decomposition still shows that the services sector contributes the largest share to GDP. However, that share has remained relatively stable since 1993 at around 44% having declined from 50% for most of 1980s. The share of manufacturing appears to have ticked up slightly to account for 22% of GDP from 20% for most of the period leading to late 1990s. However, the biggest changes appear to be in the primary sector. Having peaked at 40% of GDP in late 1990s following a steady rise after the devaluation of early 1990s, its share dropped sharply to 29% in 2000 and has since recovered to 33% of GDP. This is explained mostly by a recovery in cotton production and an increase in mining activities, particularly gold (Figure 1.2).

1.7 Finally, most the social indicators show an improvement in Burkina Faso since the early 1980s. As shown in Table 1.1, life expectancy at birth has improved steadily between 1980 and 2009, from 46 years to more than 54 years. Net primary school enrollment has risen meanwhile from 13.9% to 60.4% during the same period. For its part, the ratio of female to male primary enrollment has improved from 61% in 1980 to 89% in 2009. Despite this improvement, education remains one of the lowest in the sub-region, with a rate in 2009 still far below the second Millennium Development Goal of achieving universal primary education. Mortality rates also experienced substantial declines, as the under-5 mortality rate decreased from 239.6 to 178 per 1,000 children between 1980 and 2009. The maternal mortality ratio also declined from 770 to 660 during the same period. While some important health outcomes did not improve nearly as fast, they held steady: the 2008 HIV/AIDS prevalence rate was 1.8 percent compared to 2.03 percent in 2006. These generally positive improvements are captured by the upward trending HDI, which is a composite index of a number of social and economic indicators. As Figure 1.3 shows, Burkina Faso has kept pace with the overall positive trends observed in Sub-Saharan Africa and low income countries. However, the bad news is that the country's HDI remains far below the measure for these sets of countries.

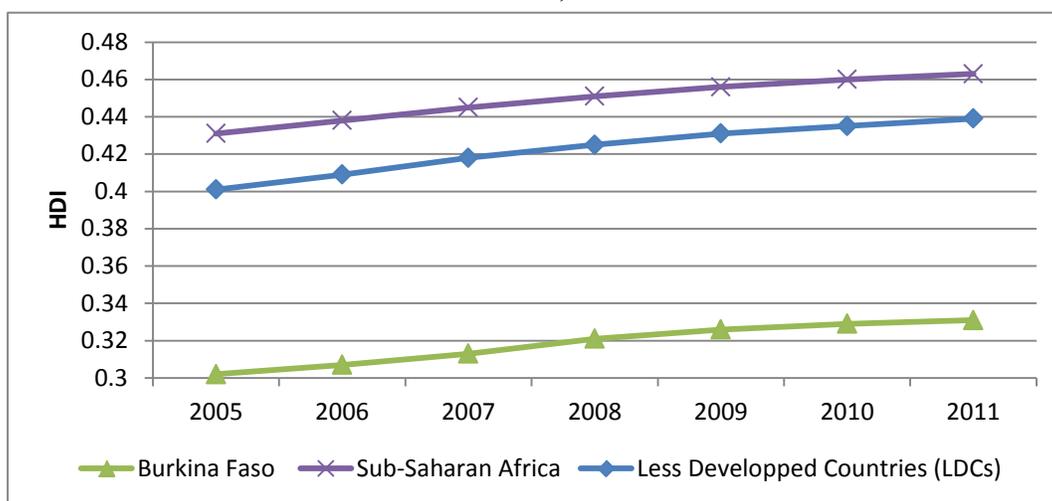
Table 1.1: The evolution of selected social indicators in Burkina Faso

	1980	1985	1990	1995	2000	2005	2009
Net primary school enrollment ratio (%)	13.9	21.0	-	31.6	34.1	43.5	60.4
Ratio of female to male primary enrollment (%)	61	60	63	66	71	80	89
Life expectancy at birth	46.3	48.0	48.5	49.0	50.2	52.4	54.5
Under-5 mortality rate (per 1,000 children)	239.6	216	204.5	198.3	190.8	183.5	178
Maternal mortality ratio (per 100,000 live births)	-	-	770	730	650	600	660*

*This figure is reported for 2008.

Source: WDI, UNESCO.

Figure 1.3: Trend in the human development index (HDI) in Burkina Faso, SSA and LDCs



Source: UNDP, HDRO (Human Development Report Office).

1.8 To summarize, in the past decade, Burkina Faso has made significant economic and social progress. A decent GDP per capita growth has been sustained in large part due to a recovery of the primary sector and a reasonable stable macroeconomic environment headlined by low and stable inflation. Even larger improvements have been witnessed in the social sectors. This raises the question as to whether similarly large changes are observed in poverty outcomes. The next section turns to answering this question. We begin with a discussion of data and the methodology and then present the direction of the changes in poverty.

B. DATA AND METHODOLOGY

1.9 Burkina Faso has a rich set of data on welfare measurement, dating back to Priority Surveys (EP - French acronym) of the 1990s. More specifically, there are potentially 4-5 surveys¹ from which poverty trends can be assessed: two Priority Surveys (1994, 1998) and two EICVM surveys (2003 and 2009). There were also two CWIQ surveys, one in 2005 and another in 2007. This provides a rare occasion to study poverty trends over a period of almost 15 years.

¹ There are at least 5 rounds of household surveys altogether starting with the Priority Survey of 1994. These are the EP (Enquête Prioritaire) of 1994 and 1998, EBCVM 2003, and EICVM 2009.

For example, the 1990s surveys were Priority Surveys which, while remaining integrated surveys, had a different focus – to capture the impact of the adjustments that were taking place during that period. By contrast the surveys in the 2000s relied on in-depth questionnaires aimed at capturing as much detailed consumption as possible. Moreover, over time, it is conceivable that natural staff turnover at implementing agencies and trade-offs that come with financial and human capital constraints may introduce changes that will affect comparability.

1.10 There are a number of reasons to suspect that comparability of surveys over time will matter in the context of Burkina Faso and will affect the magnitude of the changes. Unfortunately, however appealing it is to use these surveys to understand the progress made in poverty reduction, there is no way to compare the poverty estimates from these data sets without additional effort. In particular, a simple comparison of poverty rates estimated using the 2003 and 2009 data cannot be done. Without additional adjustments, there is no way to say whether poverty has gone up or down over that period in a credible way. Therefore, we find three issues that will affect the comparability of surveys and in particular the size of the changes.

1.11 Diary versus prospective recall: Table 1.2 summarizes one key area that introduces lack of comparability. In 2009, households received a diary to record daily their frequent purchases for a period of two weeks, but were asked to recall consumption of non-frequent items in the last 3, 6 or 12 months. By contrast, in 2003, all expenditures were collected on retrospective recall – the previous 15 days for frequent purchases and the previous month for all others. This is clearly one major source of non-comparability in the two surveys and there are no easy solutions. Past survey research has indicated that the length of recall will affect responses. Higher reported expenditures on food correlate positively with shorter recall periods. Longer recall periods are likely to result in under-reported consumption—especially for small, frequent purchases. Reports on durable goods expenditures are also likely to vary with length of recall.

Table 1.2: Comparisons, between 2003 and 2009, of the periodicity of information on household expenditures

Consumption Items	EBCVM 2003			EICVM 2009			
	Recall			Diary	Recall		
	15 days	1 month	1 year	12 days	3 months	6 months	1 year
1. Food, soft drinks							
2. Alcohol and tobacco							
3. Clothing and shoes							
4. Housing, electricity, water, gas and other fuels							
5. Furniture, household items and routine maintenance							
6. Health							
7. Transport							
8. Communication							
9. Leisure and culture							
10. Education							
11. Hotels, cafes and restaurants							
12. Miscellaneous goods and services							

1.12 Seasonality: The 2009 survey was conducted in stages throughout the year and that is one of its strengths. However, to ensure comparability, only one stage is going to be used since the 2003 survey was conducted over 3 months (June – August). The most extensive phase of the

2009 survey which included all the households, some of whom would be visited again in the rest of the year, was conducted between July and September, which is usually the “lean” season in Burkina Faso. While it is not a perfect overlap, we don’t consider this to be a major source of comparability problems between 2003 and 2009, because both surveys were done during the “lean” season. However, once you go back to the 1990s or attempt to use the CWIQ surveys, this issue may become relevant. Therefore, to the extent that seasonal patterns of consumption matter in Burkina Faso, as we believe they do, comparability of all surveys in the 1990s with those in the 2000s will be undermined.

Table 1.3: Coverage and dates of surveys

Survey	Begins	Ends	Coverage
EP 1994	October 1994	January 1995	National
EP 1998	April 1998	August 1998	National
CWIQ 2005	August 2005	October 2005	National
CWIQ 2007	February 2007	March 2007	National
EBCVM 2003	June 2003	August 2003	National
EICVM 2009	July 2009	October 2009	National

1.13 List of consumption items: A big difference between the past surveys and the 2009 was the expansion of the list in 2009. As previously noted, the food basket changed from 4 items to 33. The number of food items reported expanded to hundreds while it remained relatively small in past surveys. Altogether, there is a huge increase in the list of consumption items that households were asked to report. This is a major problem, but there is no obvious solution. Narrowing the list in the aggregate to those common across all surveys is not an option because the details in 2009 are so specific that there would be no easy way to craft matches for past surveys. Nor is it necessarily helpful especially since the INSD needs to make use of these survey innovations to the fullest possible extent.

1.14 Finally, “new goods” have been introduced into the household consumption basket in later years. The household survey questionnaire has been modified in recent rounds (especially, 2009) with new entries on additional consumption expenditure items. As an example, expenditure on internet, are not included in the 1990s surveys, but are included in the 2009 rounds. Some of these goods and services are genuinely new (e.g. the internet), while some may have been omitted inadvertently in previous years. It is not clear how to treat genuinely new goods in the construction of consumption aggregate. However, in the case where certain expenditures were not new but were simply omitted in previous years, this becomes a measurement error in consumption, which unless corrected, would lead to underestimation of poverty counts in later years compared to previous years.

1.15 How to minimize comparability problems? The multiple ways in which the survey differences arise could introduce non-trivial errors in the estimation of poverty indicators across time. Without making adjustments for these changes, one is likely to estimate incorrect trends and changes in poverty rates. Therefore, below we discuss some steps we take to minimize the impact of these differences. We use two methods to minimize the consequences of non-comparability.

1.16 Inverse probability weighting (or propensity score weighting): The basic idea here is the assumption that there is a missing data problem. The missing data are the consumption

aggregates from 2003 that were collected in the same way as the 2009 survey. Therefore, we need to create an aggregate that mimics the missing 2003 consumption aggregate (i.e, the counterfactual aggregate). To do this, we have to find information from the two surveys that will allow us to recreate the missing aggregate. We follow the method used for poverty estimates in India (Tarozzi, 2007). If we have some of the components of the consumption in both years collected the same way, we can use that information to recover the “missing” consumption in 2003. First, we estimate a probit model after stacking 2003 and 2009 and use 2009 as the comparison (no changes). We then use the predicted values from this model to obtain a “propensity score.” Next, we take the inverse of this score and use it to re-weight the consumption aggregate in 2003. The probit model will have the components of consumption that were collected the same way and other demographic variables. In Burkina, only education expenditures were collected the same way in 2003 and 2009. We estimate the propensity score using a probit model, and we include the following explanatory variables that are common to both surveys: household composition (the number of household members by age and gender); education level of the head; characteristics of the dwelling; possession of some durable goods; and per capita expenditure of goods collected with the same recall periods.

1.17 Poverty mapping: The second method does not require that parts of the consumption components be collected in the same way. Instead, it relies on simulated consumption from a model that establishes correlates between consumption and observable characteristics of households. The first step is to estimate a consumption model for the 2009 survey, regressing consumption on household characteristics such as demographic variables, age, assets and so on. Then we use the parameters of the consumption model and the unobserved components to predict consumption in previous years using variables in these surveys defined the same way as the variables used in the consumption model for 2009. Details of the model can be obtained from Elbers, Lanjouw and Lanjouw (2003).

1.18 Finally, to compare the two surveys, we use the same poverty line. This is simply to adjust the poverty line of 2009 (130,735 CFA franc) by the HCPI (Harmonized Consumer Price Index), which gives a line of 106,419 CFA francs for 2003. This is the line we would use when obtaining the fraction of the population that is poor in 2003 using the re-weighted consumption. There is no problem in the case of the poverty map approach since the poverty line of 2009 will be used for the imputed consumption for 2003 survey.

C. EVOLUTION OF POVERTY

1.19 There is a significant reduction in poverty between 2003 and 2009. The fraction of the population below the poverty lines noted above has declined by 4 to 7 percentage points. The poverty headcount is estimated at 54.5% (povmap approach) in 2003, which when compared to the poverty rate of 46.7% in 2009, suggests a 7 percentage point reduction in headcount poverty. However if we were simply to re-weight the consumption of 2003, then headcount would have declined from 51% (re-weighting approach) in 2003 to about 46.7% in 2009. These percentage point reductions suggest that poverty rates declined by around 14% between 2003 and 2009 if we use the poverty mapping method, while they declined by 8.4% if we simply re-weight the 2003 consumption. Similarly, Figure 1.1 suggests that per capita income grew by around 9% in total between 2003 and 2009. The re-weighting method will suggest that the poverty growth elasticity is almost 1 while the elasticity implied by the poverty map method is less than 1 (0.64).

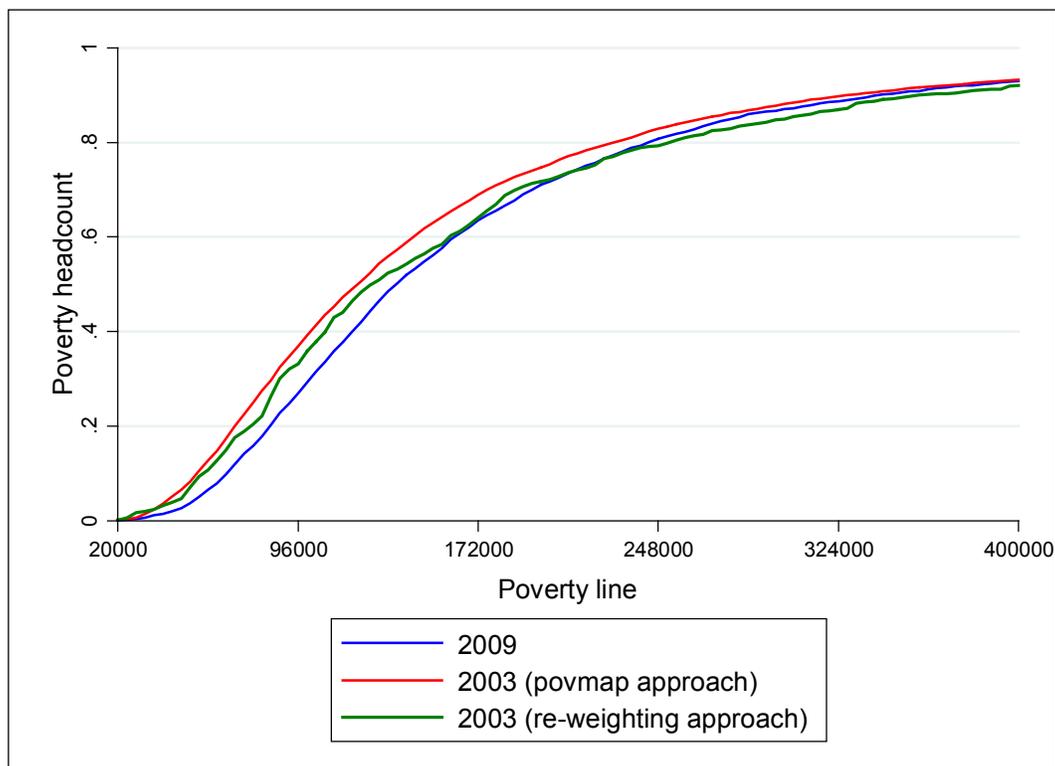
1.20 **The same positive improvements in poverty reduction are observed for other measures of poverty such as the depth and the severity indices of poverty.** Indeed, the depth index decreased from around 19%-21% in 2003 to 15% in 2009, while the severity index declined from around 10% to 7% during the period. All the differences observed between 2003 and 2009 are statistically significant. These substantial improvements in income poverty reinforce the impressive changes in social indicators.

Table 1.4: Comparisons of poverty estimates according to various approaches

	Povmap approach (estimates for 2003)	Re-weighting of consumption in 2003 (estimates for 2003)	Poverty estimates in 2009
		Poverty Line = 106419	Poverty Line=130735
National			
P0	54.46%	51.11%	46.70%
P1	20.82%	18.97%	15.12%
P2	10.32%	9.21%	6.71%
Rural			
P0	58.88%	65.76%	52.81%
P1	22.77%	25.41%	17.50%
P2	11.35%	12.66%	7.87%
Urban			
P0	34.57%	22.17%	25.18%
P1	12.05%	6.24%	6.77%
P2	5.71%	2.39%	2.64%

1.21 **The poverty estimates are robust to reasonable choices of poverty lines.** An important issue is whether the differences between the 2003 and 2009 poverty estimates remain robust to the selection of the poverty line. In other words, will choosing an alternative poverty line reverse the trends in poverty by year? To see if this happens, we compare cumulative distributions (commonly called stochastic dominance analysis) of the two surveys for various values of the poverty line (Figure 1.4). To perform such an analysis, expenditure per capita for 2003, used in the case of reweighting approach, was adjusted to reproduce a poverty headcount equal to 51% when using the same poverty line as for 2009. As can be seen from Figure 1.4, poverty always appears higher in 2003 in comparison to 2009 for any poverty line ranging from 20,000 to 400,000 CFA francs in the case of the poverty map approach. However, in the second case where we reweigh the 2003 data, a complete reversal (where the 2003 headcount poverty becomes lower than the 2009) is obtained at an annual poverty line of over 248,000 CFA francs per person. This poverty line, which would be close to a doubling of the poverty line in 2009, would be a reasonably high poverty line for the region, not just Burkina. As an example, the poverty line in Côte d'Ivoire, which is a relatively richer country in the sub-region, was about 224,000 F CFA in 2008. For this reason, we conclude that for reasonable choices of the poverty lines the poverty estimates from both methods appear to be robust.

Figure 1.4: Poverty curve comparisons between 2003 and 2009



1.22 The decline in the poverty rates happened in a context of low and declining income inequality. National level estimates of inequality suggest that broad measures of inequality declined between 2003 and 2009. The Gini fell from 43% to 40% and this holds whether we reweigh the consumption in 2003 or use the poverty mapping method. Other measures of inequality that show a decrease between periods are their index, and quantile ratios: the income gap between the 90th and 50th percentile and the gap between the 90th and 10th percentile groups. Table 1.5 also shows the evolution of the four measures of inequality by urban and rural and across 13 regions. In general urban inequality appears higher than inequality in rural areas, but while there is a broad decline in inequality in rural areas, there picture is mixed in urban areas: inequality show a decline for one method (poverty mapping) but an increase when reweighting of 2003 consumption is used. Similar drops in inequality are observed across regions.

Table 1.5: Inequality indices in 2003 and 2009

	2009				2003 (povmap)				2003 (reweighting)			
	<i>Gini</i>	<i>Theil</i>	<i>q_{90/10}</i>	<i>q_{90/50}</i>	<i>Gini</i>	<i>Theil</i>	<i>q_{90/10}</i>	<i>q_{90/50}</i>	<i>Gini</i>	<i>Theil</i>	<i>q_{90/10}</i>	<i>q_{90/50}</i>
National	0.40	0.31	5.18	2.49	0.43	0.37	6.16	2.70	0.43	0.36	6.40	2.83
Location												
Rural	0.35	0.23	4.43	2.20	0.38	0.27	5.39	2.47	0.36	0.26	4.70	2.31
Urban	0.43	0.37	6.07	2.68	0.49	0.45	8.89	3.40	0.40	0.31	6.08	2.48
Region												
Hauts-Bassins	0.41	0.33	5.26	2.74	0.46	0.42	6.44	2.96	0.40	0.30	5.03	2.27
Boucle du Mouhoun	0.33	0.21	4.11	2.02	0.42	0.37	5.59	2.55	0.38	0.26	5.54	2.85
Sahel	0.44	0.37	6.89	2.73	0.32	0.18	4.22	2.31	0.34	0.20	4.12	2.36
Est	0.37	0.25	4.56	2.33	0.35	0.22	4.33	2.38	0.35	0.24	3.53	1.79
Sud-Ouest	0.37	0.29	4.30	2.12	0.41	0.31	5.88	2.65	0.39	0.29	4.26	2.33
Centre-Nord	0.36	0.26	4.33	2.32	0.39	0.28	5.89	2.49	0.33	0.20	4.66	2.32
Centre-Ouest	0.35	0.23	4.39	2.23	0.41	0.31	6.26	2.61	0.41	0.28	6.83	3.17
Plateau central	0.33	0.23	3.73	1.97	0.39	0.33	5.25	2.17	0.42	0.68	3.82	2.27
Nord	0.38	0.28	4.88	2.47	0.40	0.30	5.90	2.84	0.39	0.30	5.55	2.70
Centre-Est	0.37	0.26	4.59	2.36	0.40	0.29	5.67	2.63	0.35	0.22	4.70	2.46
Centre	0.44	0.39	6.38	2.79	0.52	0.53	11.08	3.87	0.41	0.33	6.59	2.73
Cascades	0.33	0.21	4.10	2.09	0.40	0.31	5.15	2.49	0.49	0.54	10.40	4.36
Centre-Sud	0.31	0.18	3.50	1.93	0.35	0.23	4.32	2.21	0.35	0.21	5.03	2.25

1.23 **The most unequal regions appear to be the richest and the poorest.** The Centre region (where Ouagadougou is located) is one of the richest and so we would expect the inequality there to be high, which it is. However, the poorest regions of Sahel also appear to have high inequality. Surprisingly, while the inequality in the Centre region has remained about the same over time, the measured inequality in the Sahel has increased.

1.24 **While growth is the main catalysts for the decreased poverty trends in rural areas, changes in inequality played an important role in urban areas.** A decomposition of the changes in the poverty trends between 2003 and 2009 shows that growth of income accounted for most of the changes in poverty in rural areas. However the results in Table 1.6 suggest that the story is different in urban areas. For both the poverty mapping and re-weighting methods the general conclusion is that changes in inequality drove the observed changes in urban poverty.

Table 1.6: Decomposition of poverty change between 2003 and 2009

	Reference is 2003 (povmap)				Reference is 2003 (reweighting)			
	<i>Growth</i>	<i>Redistribution</i>	<i>Residual</i>	<i>Difference</i>	<i>Growth</i>	<i>Redistribution</i>	<i>Residual</i>	<i>Difference</i>
P0								
National	-4.7*	-2.7*	-0.6	-7.9*	-0.2	-3.8*	-0.4	-4.5*
Rural	-3.8*	-1.9*	-0.6	-6.3*	-11.9*	-2.1	1.1	-13.0*
Urban	-1.1	-8.3*	-0.1	-9.4*	-0.1	3.2	-0.1	3.0
P1								
National	-2.6*	-3.1*	-0.0	-5.7*	-0.3	-3.6*	0.0	-3.8*
Rural	-2.2*	-3.0*	-0.1	-5.3*	-6.7*	-1.3	0.2	-7.9
Urban	-0.4	-4.9*	0.1	-5.3*	-0.1	0.6	-0.0	0.5
P2								
National	-1.6*	-2.2*	0.2	-3.6*	-0.2	-2.3*	-0.0	-2.5*
Rural	-1.4*	-2.2*	0.1	-3.5*	-3.9*	-1.0	0.1	-4.8*
Urban	-0.2	-2.9*	0.1	-3.1*	-0.0	0.3	-0.0	0.3

(*) means that the statistic is significant at 5% level.

1.25 **The emerging picture from the preceding paragraphs, once we resolved some of the data limitations, is that overall welfare situation in Burkina Faso have improved.** Poverty rates have come down. So have inequality levels. Furthermore, growth in consumption (presumably financed by growth in incomes) accounts for most of the changes in rural areas, while changes in inequality play a more prominent role in urban areas. The next section extends these results by looking at the profile of the poor along multiple socio-economic dimensions. Such an approach, which allows one to tease out the most salient features of poor households, can prove very useful for the targeting and formulation of policies to combat poverty. Poverty can be analyzed along multiple characteristics such as geographical (e.g., area of residence, region), household demographic (e.g., household size) and household head (e.g., age, sex, education level, marital status).

D. POVERTY PROFILES

1.26 **As many as 8 out of 10 poor people still live in rural areas in 2009.** Incidence of urban poverty was slightly less than half that of rural poverty in 2009 (Figure 1.5). The same trend can be observed for 2003, despite some differences between the poverty map (povmap) approach and the re-weighting approach with respect to the size of the urban-rural gaps. Indeed, the 2003 poverty map estimates place rural and urban poverty at 59% and 35%, respectively, while the re-weighting approach yields estimates of 66% and 22%. Results from analysis of dominance, presented in Figure 1.6, confirm that the urban-rural poverty gap remains for any given poverty line between 10,000 and 400,000 FCFA.

Figure 1.5: Poverty headcount by area of residence (urban and rural)

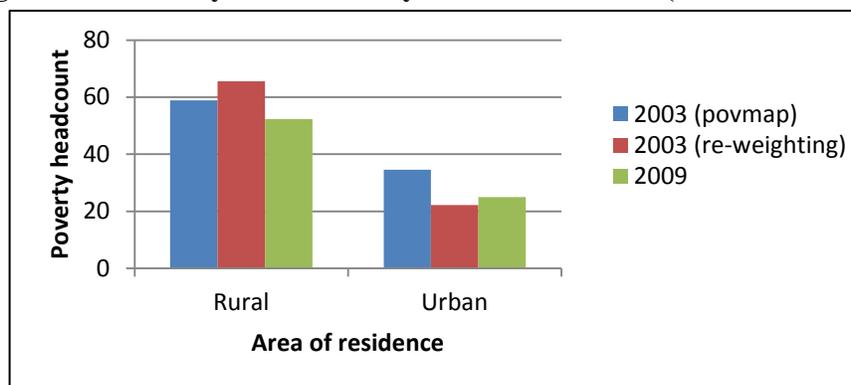
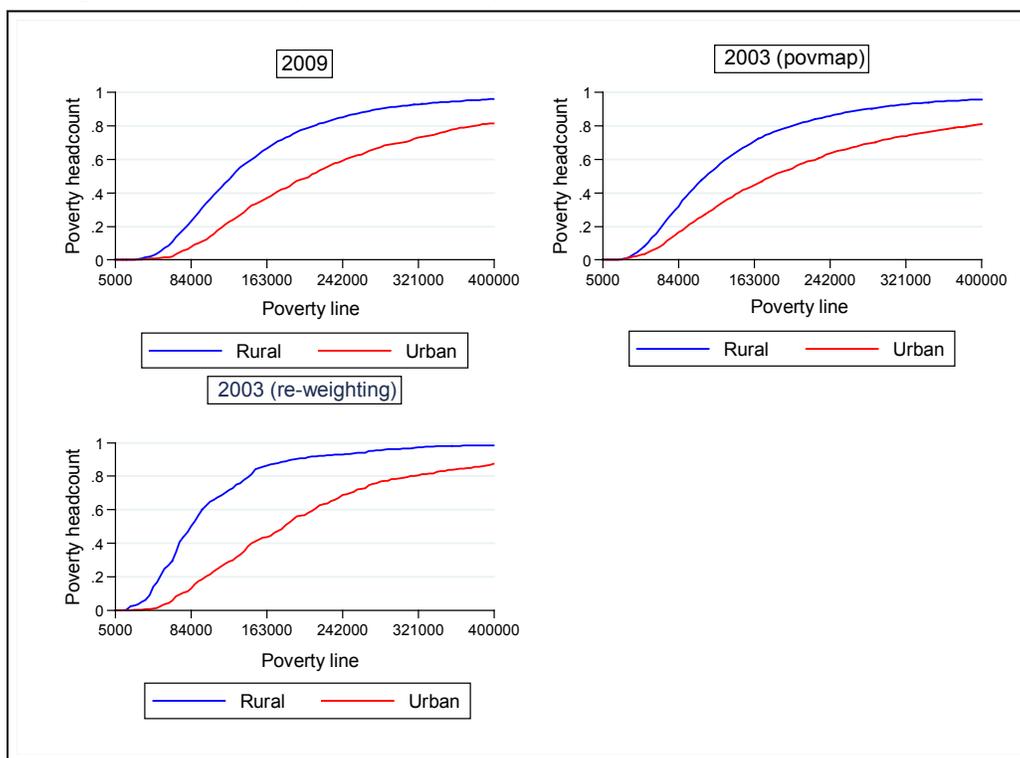
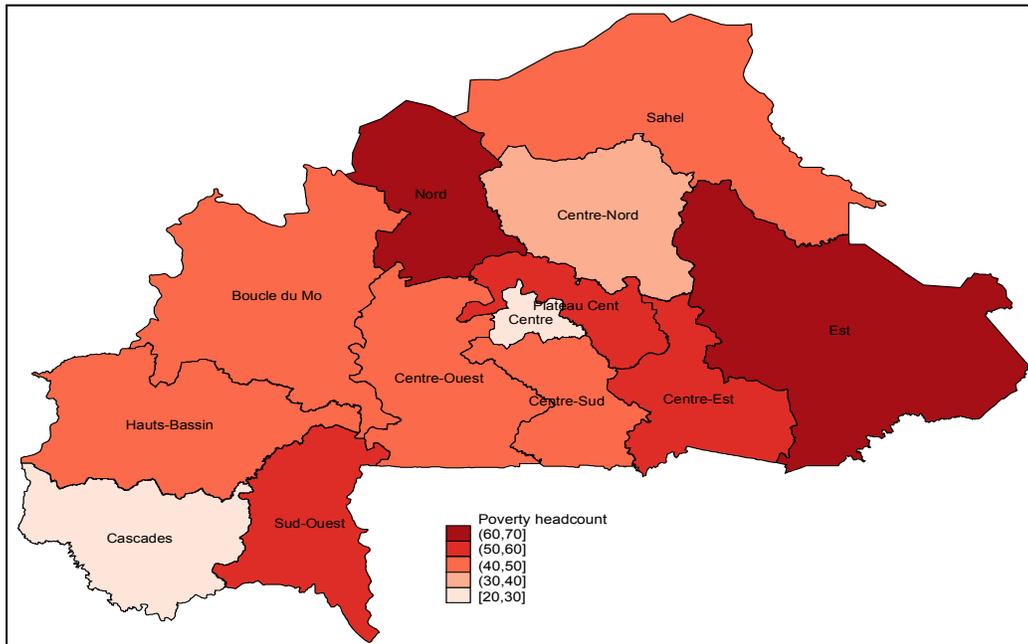


Figure 1.6: Poverty dominance by area of residence (urban and rural)



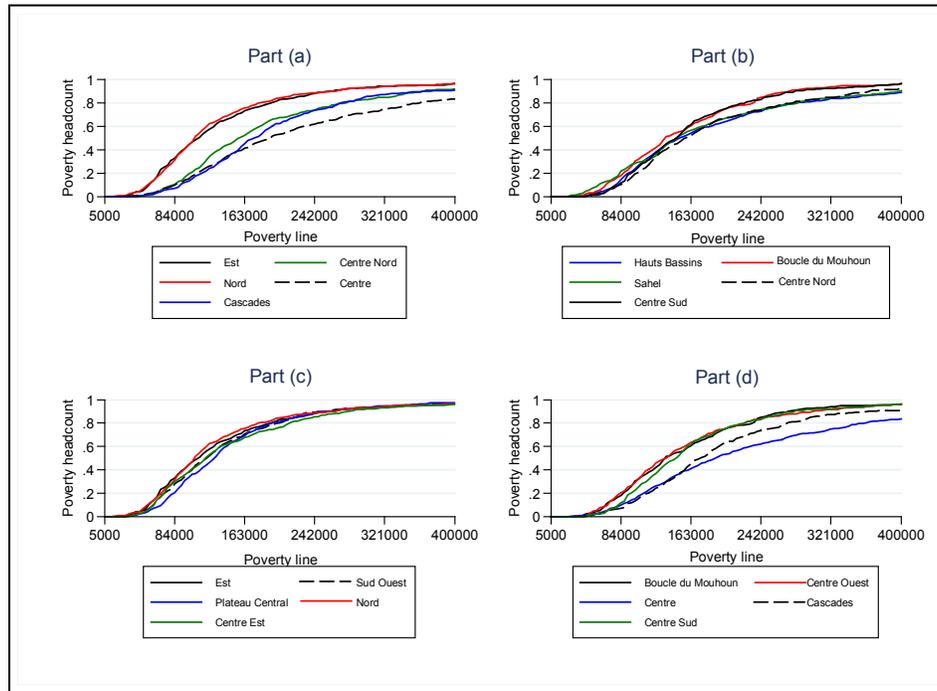
1.27 **Figure 1.7 illustrates the marked regional disparities of poverty in Burkina Faso in 2009.** While two regions (Centre and Cascades) have poverty rates below 30%, other regions such as Est and Nord are considerably poorer, with poverty rates in excess of 60% – more than double those of the first two. Three regions (Sud-Ouest, Plateau Central and Centre-Est) are also found to have relatively high poverty rates (50 to 60%), well above the national average. There are five regions whose poverty incidence tends to cluster around the national average, including three (Hauts-Bassins, Sahel, Centre-Sud) above and two (Boucle du Mouhoun, Centre-Ouest) the mean.

Figure 1.7: Poverty headcount by region in 2009



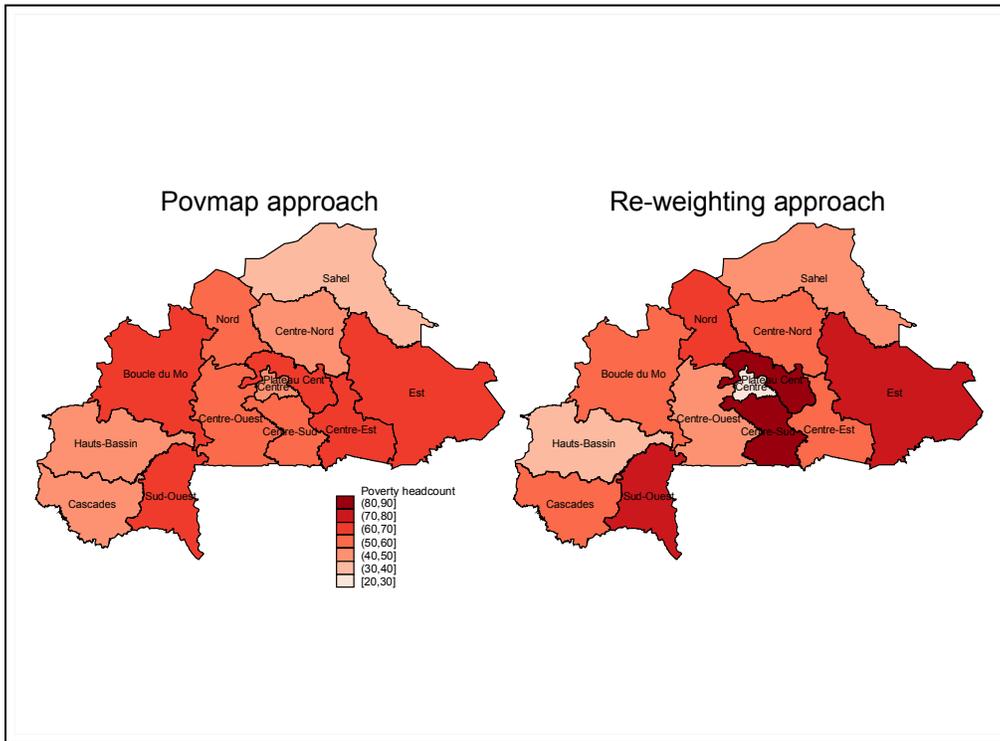
1.28 **A closer examination of regional income distributions confirms that some regional differences are robust to the selection of a range of different poverty lines.** As shown in part (a) of Figure 1.8, some regions such as Est and Nord remain poorer than Centre (which includes Ouagadougou), Centre-Nord and Cascades, regardless of the poverty threshold level set between 10,000 and 400,000 FCFA. The curves representing poverty in the Nord and Est regions intersect, indicating the lack of a robust difference in poverty incidence between the two poorest regions. There is also no clear ranking among the Sahel, Hauts Bassins, Centre-Sud and Centre-Nord regions (see part b, Figure 1.8). More generally, there is no clear dominance among the five poorest regions of the country (i.e., those with poverty rates above 50%), namely Est, Centre-Est, Nord, Plateau Central and Sud-Ouest (part c of Figure 1.8)

Figure 1.8: Poverty dominance by region in 2009



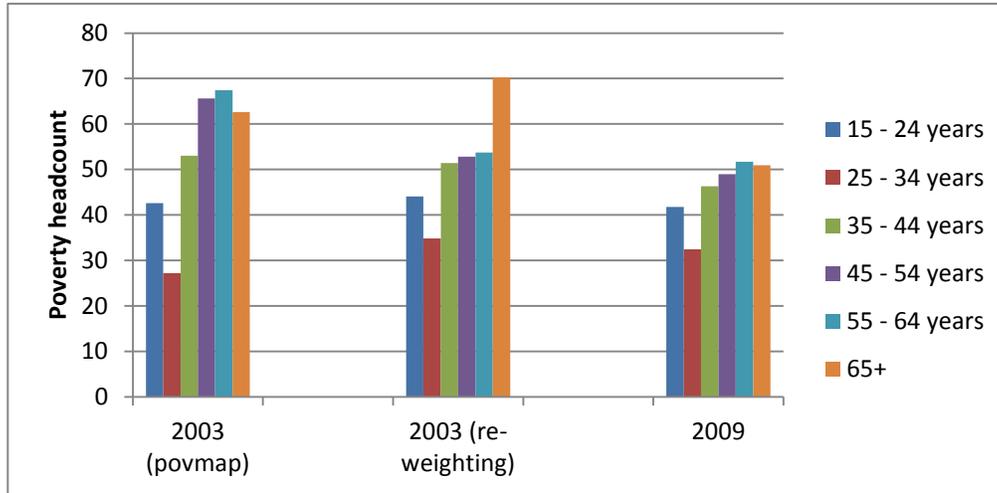
1.29 **The regional distribution of poverty has changed between 2003 and 2009 (Figure 1.9).** However, the scope of the changes in re-ranking across time depends on the method chosen. The re-weighting approach, for example, seems to engender more regional disparities in poverty incidence, with poverty rates that can vary from 20 to 90%, compared to a tighter interval of 30 to 70% for the poverty map approach. Which means that the ranks of regions do not remain robust to the selection of the different approaches for data comparability. We estimated Spearman's rank correlation coefficients (a measure of the statistical relationship between two variables) to examine the extent of these shifts in rankings between the 13 regions. A coefficient of 1 indicates that the poverty ranking remained unchanged, while a complete re-ranking (complete reverse ranking) of all regions results in a value of -1. We obtain a value of 0.76 when comparing the 2009 rankings and the 2003 imputed consumption using the poverty mapping approach. The coefficient drops to 0.61 when comparing the 2003 re-weighting approach with the 2009 results, confirming that this approach introduces a wider regional divergence than the poverty map approach. The small differences between these two approaches are reflected in a joint rank correlation coefficient of 0.76.

Figure 1.9: Poverty headcount by region in 2003



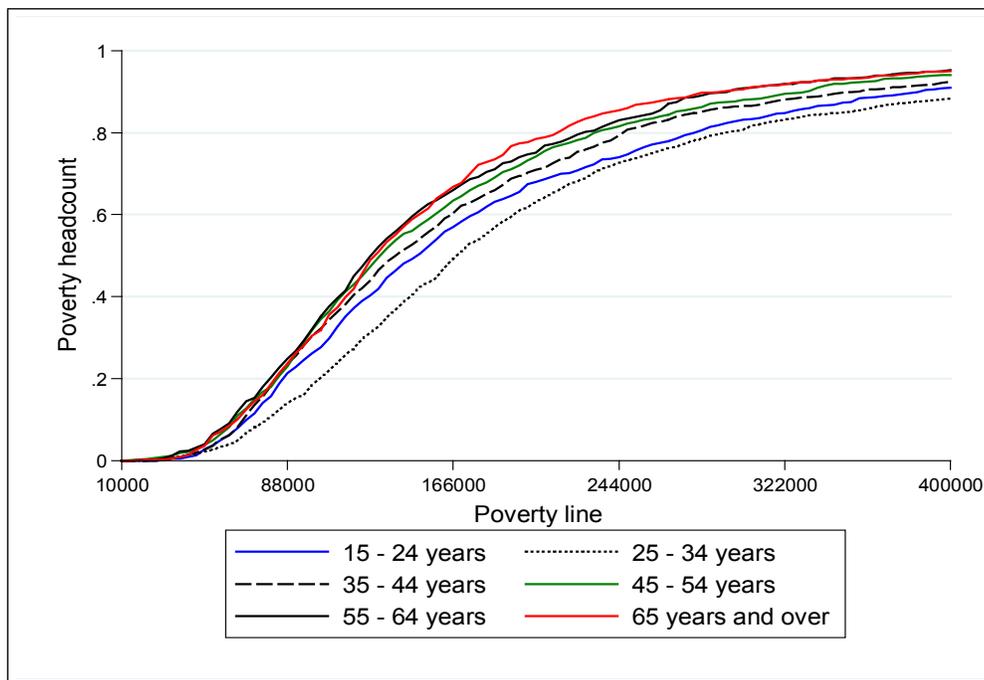
1.30 **Analysis by age of the household head indicates that those in the age category of 25-34 years constitute the least poor group.** As illustrated in Figure 1.10, this remains the case regardless of the year (2003 versus 2009) or measurement approach. Those living in households with heads over 45 years of age appear to be the poorest, with poverty incidence around 50% in 2009. For that same year, poverty among those living in households with a head aged 25 to 34 years is at 32.5%, while poverty levels for those whose heads are in the 15-24 and 35-44 age category are, respectively, at 42% and 46.4%. In 2003, the re-weighting approach results in a greater disparity among households headed by people aged 65 and over, as their estimated poverty incidence of 70% outstrips those of other age groups (with poverty rates of 53.7% and below). The poverty map approach, meanwhile, estimated similarly high poverty incidence for individuals with household heads aged 45 and over, with levels ranging from 62.6% to 67.4%.

Figure 1.10: Poverty headcount by age category of household head



1.31 The same results are obtained by looking at the entire distributions of income by age groups of household heads (Figure 1.11). For example, for any poverty line set between 40,000 and 400,000 CFA francs, the 25 to 34 head age category dominates the other age groups. One also notes the dominance of the 15 to 24 age category relative to all others (save the 25-34 head age cohort). By contrast, we do not obtain a robust ranking among the 4 oldest age categories, as their poverty curves cross at points.

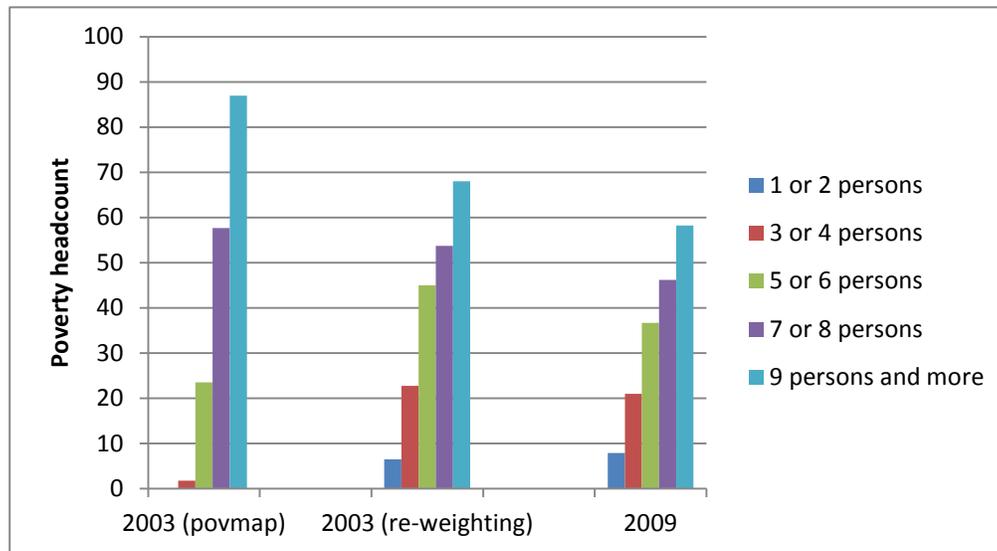
Figure 1.11: Poverty dominance by age group of household head in 2009



1.32 Figure 1.12 shows wide disparities in poverty levels by household size. In 2009, while the incidence of poverty among individuals in households with 9 or more people is estimated at 58%, the rates drops by household size to 46% (7-8 people), 37% (5-6 people), 21% (3-4 people)

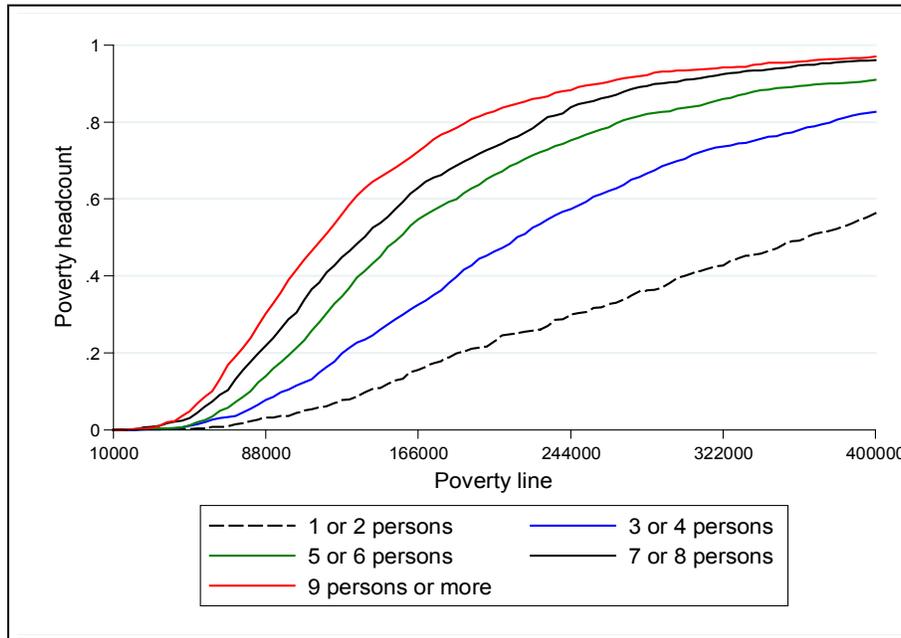
and 8% (1-2 people). These large gaps are also observed in the 2003 estimates, with pronounced differences with the re-weighted approach and even starker differences with the poverty map approach.

Figure 1.12: Poverty headcount by household size



1.33 **Figure 1.13 unambiguously confirms these disparities, as each household poverty curve dominates those curves of any larger households.** Yet this result can be explained in part by the approach used to estimate the average income of each individual in a given household. Indeed, the calculation of per capita income – i.e., total household income divided by the number of members in the household – assumes that individuals face the same needs regardless of age or gender. Therefore, households with many children will be more likely to experience poverty, as these children do not typically make contributions to overall household income. Lanjouw and Ravallion (1995) show that the correlation between poverty and household size tends to disappear when adjustments are made to the calculation of average household income. Hence, approaches other than simple per capita measurements, such as those employing household “equivalence scales”, are sometimes used. A relatively recent literature focuses instead on an alternative “intra-household allocation” approach. In addition, the analysis of sequential dominance, which takes into account household size as a discrete indicator of well-being (Duclos, Sahn and Younger, 2006), offers another suggested alternative for poverty comparisons.

Figure 1.13: Poverty dominance by household size in 2009



1.34 **Engel's method is based on the assumption that households with the same budget share of food expenditure also have the same level of welfare.** The approach consists of regressing the food share of overall household expenditure on the logarithm of per capita expenditure, the logarithm of household size, and the proportions of individuals in the household by sex and age groups, as well as other socioeconomic and demographic characteristics of the household used as control variables. Significance tests of the coefficients for the household composition variables are used to verify the existence of equivalence scales, while statistically significant ratio of the coefficients of log-linearized household size and per capita expenditure, is used to test the existence of economies of scale in household expenditure.

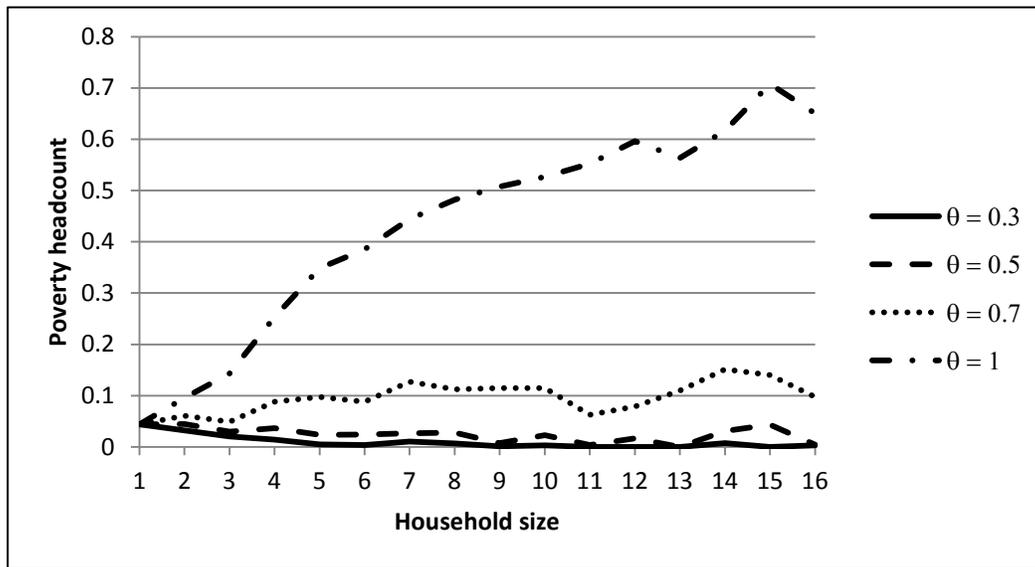
1.35 **The results in Table 1.7 suggest that economies of scale in consumption are present in Burkina households.** The estimation uses only EICVM 2009 data. To ensure consistent results, a good portion of households – those deemed too poor (3,657) or too rich (553) – was excluded from the model. Indeed, the extreme poverty of many households in Sub-Saharan Africa sometimes induces behaviors inconsistent with the theory of demand for food, thereby leading to unusual results when these households are included in the model. The results in Table 1.7 suggest that these equivalence and economy of scale effects are indeed present in Burkina Faso (see also Figure 1.14). The coefficients of household composition, suggesting differences in household equivalence, are especially significant, both for rural areas and nationally. These same coefficients are less robust, however, in the urban sample since only the proportion of boys (aged 0 to 5) variable displays a coefficient significant at the 10% level. One possibility, which we do not explore in this note, could be statistical power on account of smaller samples from urban areas. Conversely, economies of scale seem to be more salient in the urban areas since, as shown in Model II, the Wald test fails to reject the null hypothesis of no economies of scale.

Table 1.7: OLS estimation results of Engel curves for food expenditure

<i>Explanatory Variables</i>	<i>Model I</i>			<i>Model II</i>		
	<i>National</i>	<i>Rural</i>	<i>Urban</i>	<i>National</i>	<i>Rural</i>	<i>Urban</i>
Log (per capita expenditure)	-0.053***	-0.022*	-0.098***	-0.036***	-0.007	-0.073***
Log (household size)	-0.028***	-0.031***	-0.019*	-0.033***	-0.029***	-0.033***
% boys aged 0-5	0.079***	0.091**	0.072*	0.088***	0.085**	0.109**
% boys aged 6-13	0.097***	0.120***	0.055	0.110***	0.144***	0.059
% boys aged 14-17	0.071*	0.095*	0.038	0.041	0.077	0.012
% girls aged 0-5	0.086***	0.118***	0.032	0.093***	0.118***	0.061
% girls aged 6-13	0.096***	0.121***	0.056	0.081***	0.108***	0.052
% girls aged 14-17	0.102***	0.160***	-0.006	0.073**	0.116**	0.003
% adult women	0.056***	0.075***	0.039	0.030	0.060**	0.017
Urban	-0.102***			-0.004		
Female household head				0.010	0.016	0.002
Age of head				0.000**	0.000	0.001**
Primary education				-0.027***	-0.028**	-0.016
Secondary education				-0.087***	-0.115***	-0.052***
Private sector				0.017	-0.066*	0.024
Independent agriculture				0.050***	0.050**	0.052***
Other independent				0.019	0.013	0.021
Unemployed and inactive				0.025	0.046*	0.003
Boucle du Mouhoun				0.062***	0.063***	0.026
Sahel				0.176***	0.172***	0.040*
Est				0.017	0.025	-0.068**
Sud-Ouest				-0.013	-0.002	-0.073**
Centre-Nord				0.118***	0.112***	0.114***
Centre-Ouest				0.037***	0.045***	-0.013
Plateau Central				-0.020	-0.029	0.001
Nord				0.065***	0.080***	-0.016
Centre-Est				0.009	0.008	0.006
Centre				-0.037***	-0.172***	-0.013
Cascades				0.049***	0.056***	0.021
Centre-Sud				0.000	0.003	-0.029
Constant	1.273***	0.891***	1.727***	0.977***	0.616***	1.400***
# observations =	4194			4194		
R ² =	0.122			0.263	2498	1696
F =	46.02	2498	1696	37.65	0.257	0.143
Wald test: $\beta_2/\beta_1 = 0$ =	(0.00)	0.016	0.069	(0.00)	24.64	10.19
	14.42	3.70 (0.00)	8.55 (0.00)	10.06	(0.00)	(0.00)
	(0.00)	2.82 (0.09)	3.52 (0.06)	(0.00)	0.37 (0.54)	5.78 (0.02)

(*), (**) et (***) denote statistically significant coefficients at the 10%, 5% and 1% levels, respectively.

Figure 1.14: Correlations between household size and poverty according various levels of economies of scale



1.36 In Burkina Faso, households headed by females seem to experience less poverty than those headed by males. As illustrated in Figure 1.15, the poverty rate among individuals from households headed by a woman in 2009 is about 37%, compared to 47% for those in male-headed households. The differences in 2003 appear more pronounced, as the poverty map approach yields a gap of 56% versus 29% and the re-weighting approach leads to gap of 53% versus 23.5%. The results in figure 1.16 graphically confirm this differential result for 2009. Although the poverty curves of the two household types overlap at relatively small poverty thresholds, the dominance of female headed households becomes evident at the 50,000 FCFA level, and remains so even up the 400,000 FCFA level. It is useful to keep in mind that female headed households are, on average, smaller. Therefore, if one ignores the presence of economies of scale in the data, they are more likely to be non-poor. Conversely, poverty among male-headed households might be over-stated based on the per capita consumption measures that are unadjusted for economies of scale (see Figure 1.14). This is an issue that warrants a separate and more complete analysis linking gender and poverty in Burkina Faso.

Figure 1.15: Poverty headcount by sex of household head

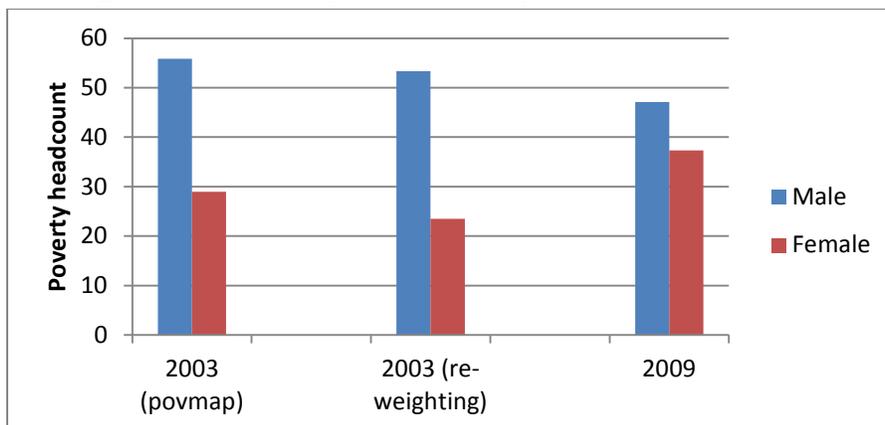
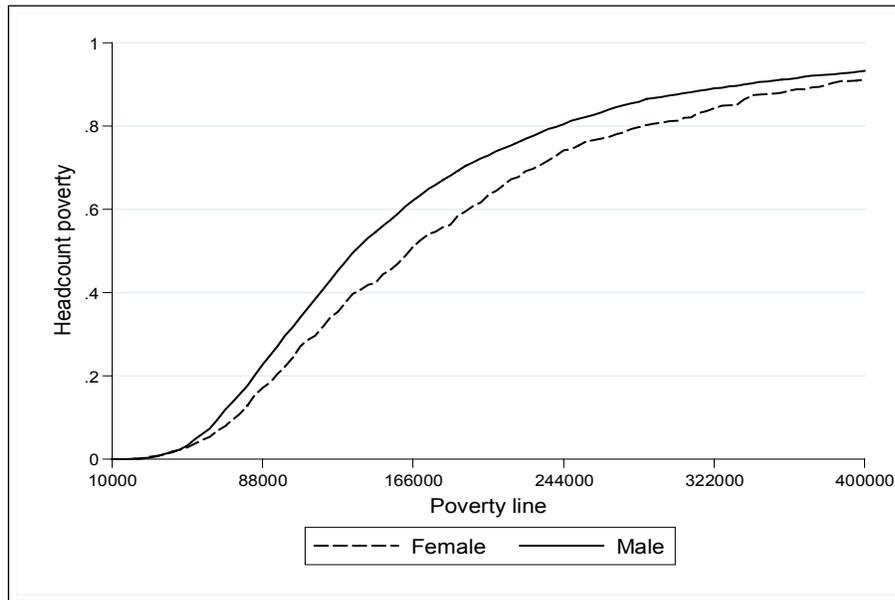


Figure 1.16: Poverty dominance by sex of household head in 2009



1.37 Poverty incidence decreases significantly as the level of education of the household head increases, both in 2003 and 2009. Education is an important component of the multidimensional concept of well-being. A lack of education is itself a manifestation of poverty as described in the writings of Amartya Sen, who argues that poverty results from the lack of capabilities to function effectively in society. Indeed, one typically finds a negative correlation between education levels and income poverty. Figure 1.17 illustrates the distribution of income poverty by level of education of the household head. In 2009, the proportion of poor households whose head has no education is about 50%, and this share decreases to 38% and 11% respectively for the primary and secondary levels. These findings present a call for action, in view of the fact that Burkina Faso's net primary enrollment rate, at 60%, is one of the lowest in the sub-region and remains well below the second Millennium Development Goal of universal primary education. Graphical evidence from a dominance analysis (see Figure 1.18) confirms these differences by education level of the household head. Households whose head has at least some secondary schooling rather clearly dominate other households. Similarly, households whose head has at least some primary education dominate those whose head has no schooling whatsoever. These results indicate that, even if universal primary education remains an important goal to achieve, further schooling beyond the primary level should be encouraged. Indeed, given the growing importance of the tertiary/service sector and other opportunities linked to new information technologies, the case for education beyond the primary level is increasingly compelling.

Figure 1.17: Poverty headcount by education level of household head

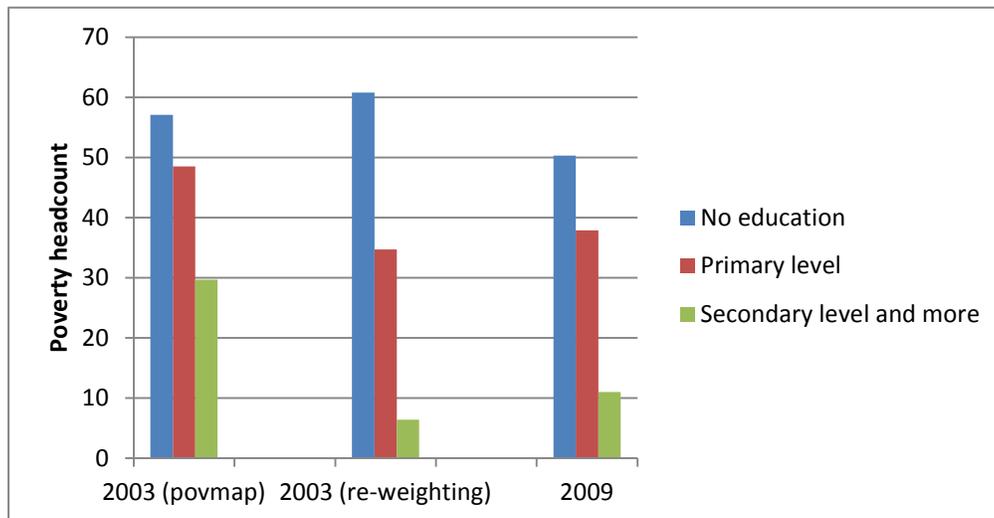
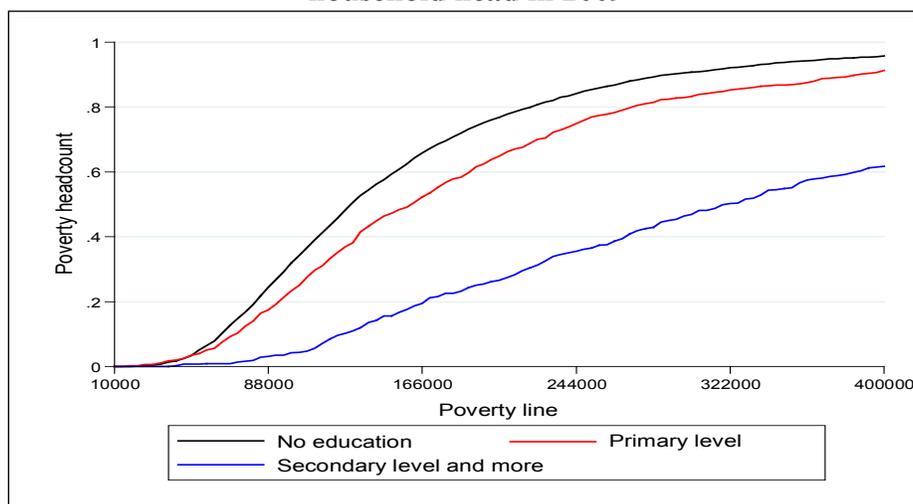


Figure 1.18: Poverty dominance by education level of household head in 2009



1.38 **Analyzing the statistical relationship between poverty and marital status of the head offers another insight into household welfare in Burkina Faso.** The results presented in Figure 1.19 illustrate that households with a polygamous head face a higher likelihood of being poor. Almost 20 percent of the polygamous households in the sample are female-headed households within a polygamous union. The comparatively large household size of polygamous households may give rise to this finding. However, polygamy is sometimes viewed as a marker of wealth since individual men, the argument goes, may only avail themselves of an additional spouse if they have sufficient means to support her. Yet the evidence presented here suggests that the increased household size among polygamous households has a dampening effect on welfare. In the same graph, households headed by single/unmarried individuals are the least poor on average. This result is not surprising if one assumes that small households are more likely to have a single head. Further dominance analysis (see Figure 1.20) confirms these differences. Thus, polygamous households find themselves dominated – in terms of poverty levels – by other households within the threshold range of 10,000 to 400,000 FCFA. Moreover, households

headed by single individuals dominate all other households, particularly for higher levels of the poverty threshold. Once again, caution in interpreting these results is called for, because they may be driven by small sample problems and the economies of scale issues raised above. On the latter, we noticed that male headed widows are a very small fraction of the population, but they face the highest probability of being poor. They are followed by female headed households in “union libre.”

Figure 1.19: Poverty headcount by marital status of household head

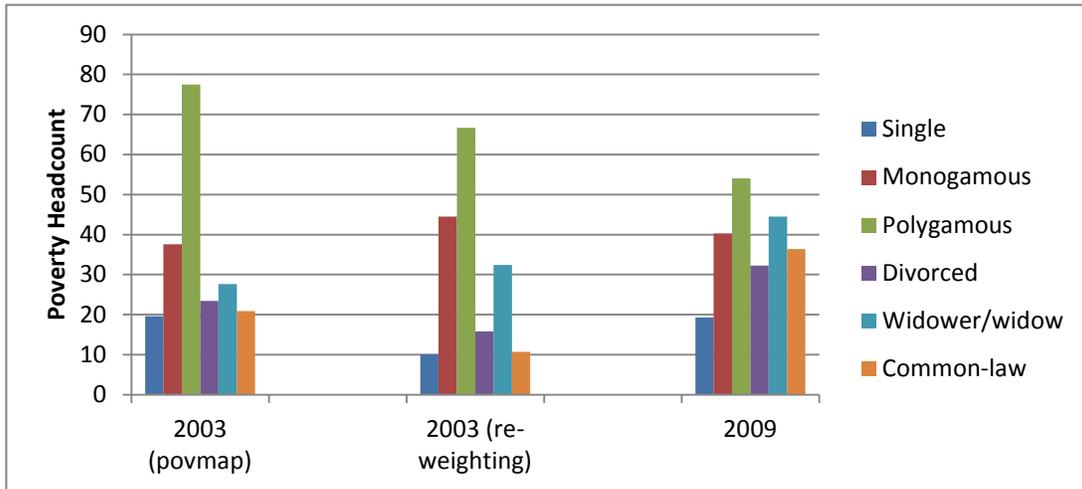
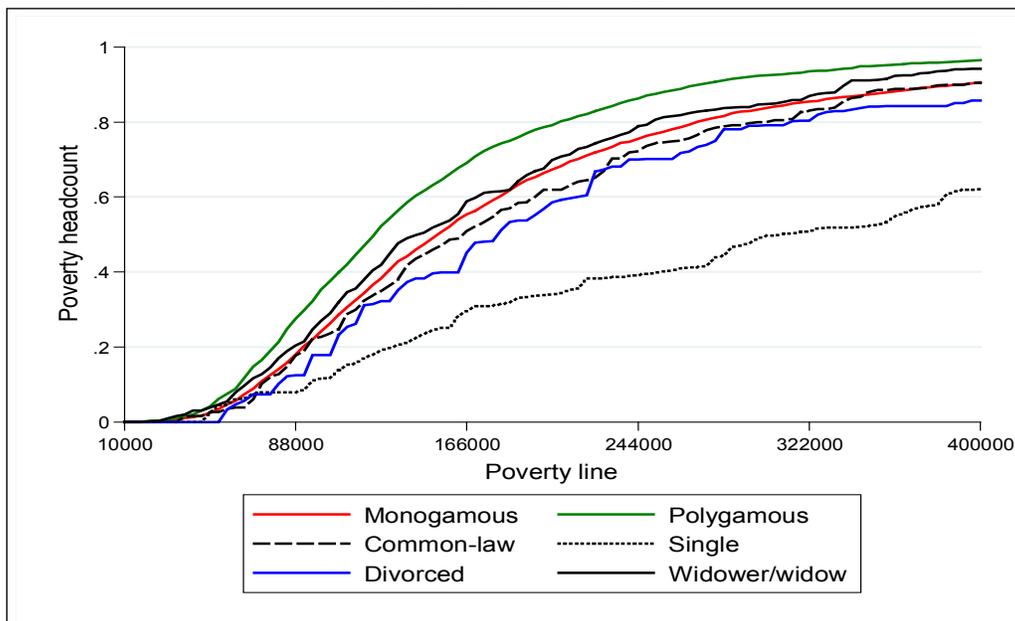


Figure 1.20: Poverty dominance by marital status of household head in 2009



1.39 Figure 1.21 shows disparities in the poverty according to the employment sector of household head. Not surprisingly, the majority of the poor are people who work on their own farms. The likelihood of being poor for a household head who is working on his/her own farm is

about 54% in 2009. Another group with a high probability of being in poverty is households headed by inactive and unemployed. They face a 40% probability of falling into poverty. By contrast, those whose heads are employed in the public sector are the least poor with only a likelihood of 7.6% of being in poverty. This confirms a common finding that shows that most of the poor are working poor. These differences are confirmed when using EBCVM 2003 even though their magnitude depends on the approach used. The disparities are larger with reweighting approach where the likelihood of being poor is 69% for people working in own-farm agricultural sector and only 3% for those in the public sector. With the povmap approach, the differences are less pronounced since the poverty incidence varies from 26% (public sector) to 59% (independent agricultural sector). The dominance analysis (see Figure 1.22) shows that the differences between sectors are maintained regardless of the choice of the poverty line. It appears from these observations that growth will most likely promote poverty reduction if it focuses on agricultural development.

Figure 1.2121: Poverty headcount by employment sector of household head

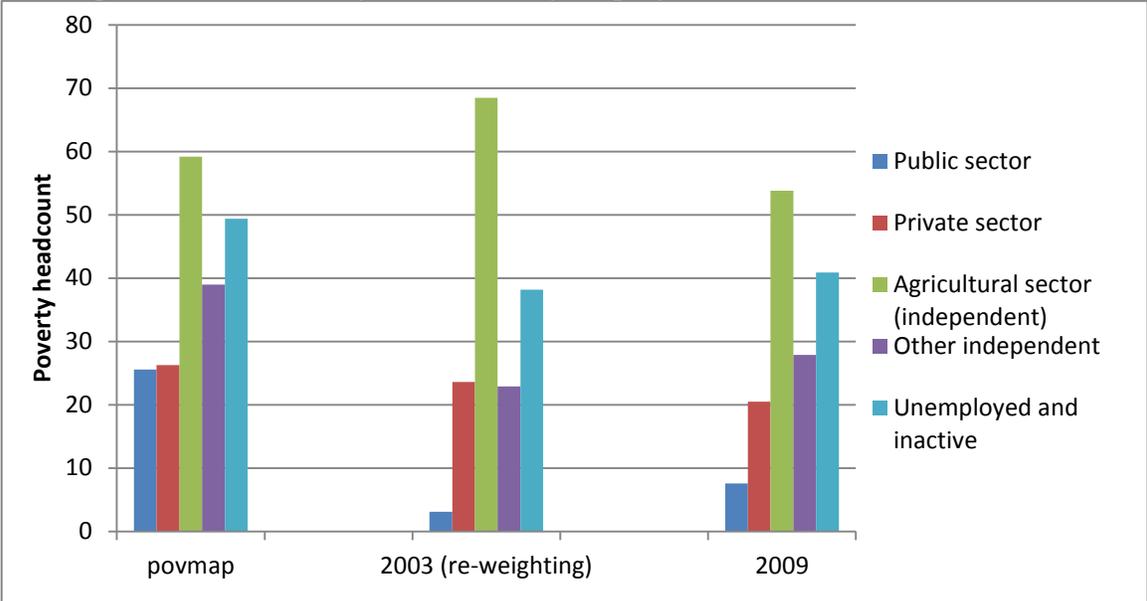
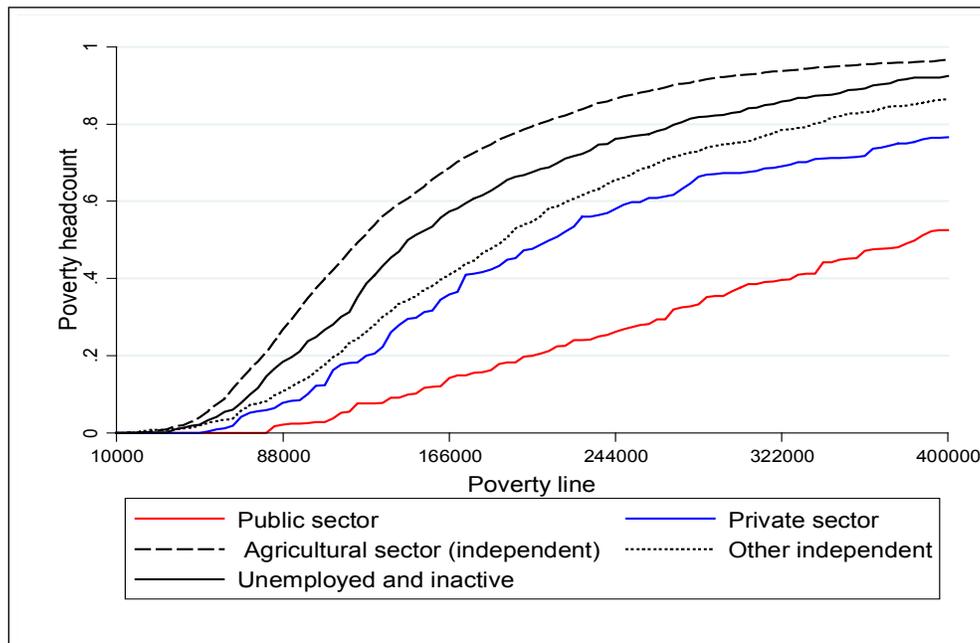


Figure 1.22: Poverty dominance by employment sector of household head in 2009



E. CORRELATES OF POVERTY

1.40 Poverty profiles shed light on the correlations between poverty and the socioeconomic characteristics of the household. They provide a measure of the likelihood of being poor (or not) for possessing a single characteristic, e.g. being secondary educated, or being of a specific age. However, there is no reason to confine the analysis to simple profiles. Such correlations alone are not sufficient to suitably understand the correlates of poverty in Burkina Faso. Therefore, in this section we look at multivariate analysis of correlates of poverty. We use a probit or logit regression models to identify the key correlates of poverty. In these models, the dependent variable is a binary one that takes a value of 1 if the household is poor and 0 otherwise. Furthermore, a log-linear model of per capita expenditure will be performed to complete the analysis.

1.41 **The multivariate results of the correlates of poverty confirm most of the results obtained under the profile (Table 1.8).** The composition and size variables prove to be important since an increase in household size, as with the proportions of children, increases the probability of a household being poor. This result is not surprising given the evidence, cited earlier, of economies of scale in household consumption in Burkina Faso. Ignoring this effect in the estimation of average household income would lead one to overestimate poverty levels for large households and those with a large share of children. Furthermore, households that own the dwelling in which they live have a 5.5% higher probability of being poor. This counter-intuitive finding is perhaps a reflection of quality of housing. It is indeed possible to imagine that the poorest households cannot afford to live in good neighborhoods and would instead opt to construct a low quality house to live in. The fact that this correlation is even stronger in cities than in rural areas seems to confirm our conjecture that this variable captures housing quality more than ownership.

Table 1.8: Estimation of correlates of poverty in Burkina Faso, 2009

	National		Rural		Urban	
	Coefficient	Marginal effect	Coefficient	Marginal effect	Coefficient	Marginal effect
Composition and size of household						
household size	0.093***	0.020	0.098***	0.024	0.094***	0.010
% boys aged 0 - 5 years	3.604***	0.767	3.661***	0.884	4.158***	0.433
% boys aged 6 - 13 years	3.461***	0.736	3.721***	0.898	2.914***	0.303
% boys aged 14 - 17 years	2.352***	0.500	2.538***	0.613	2.023**	0.211
% girls aged 0 - 5 years	3.618***	0.770	3.580***	0.864	4.498***	0.468
% girls aged 6 - 13 years	3.392***	0.722	3.740***	0.903	2.464***	0.257
% girls aged 14 - 17 years	2.736***	0.582	3.247***	0.784	1.595	0.166
% adult women	0.520	0.111	0.866**	0.209	0.025	0.003
Household dwelling status						
Household is homeowner	0.269**	0.055	0.261*	0.061	0.589***	0,060
Characteristics of the household head						
Sex (female = 1)	-0.081	-0.017	-0.012	-0.003	-0.467	-0,043
Age	0.012***	0.003	0.015***	0.004	-0.004	0,000
Primary education level	-0.246**	-0.051	-0.236***	-0.056	-0.374**	-0,036
Secondary education	-1.104***	-0.190	-0.776***	-0.169	-1.456***	-0,121
Polygamous	-0.192**	-0.040	-0.183**	-0.044	-0.414**	-0,038
Common-law	0.299	0.067	0.443*	0.110	-0.239	-0,023
Single	0.483	0.110	0.374	0.092	0.383	0,045
Divorced	0.064	0.014	-0.086	-0.021	0.705	0,094
Widower	0.134	0.029	0.097	0.024	0.458	0,055
Private sector	0.797**	0.187	-0.695	-0.152	0.861*	0,112
Independent agricultural	1.352***	0.260	1.074***	0.231	1.443***	0,216
Other independent	0.622*	0.141	0.250	0.061	0.580	0,063
Unemployed and inactive	1.043***	0.245	0.774	0.191	1.075**	0,145
Geographical characteristics						
Urban	-0.450***	-0.092	-	-	-	-
Boucle du Mouhoun	-0.291*	-0.059	-0.169	-0.040	-1.904***	-0,103
Sahel	-0.798***	-0.145	-0.694***	-0.155		
Est	0.056	0.012	0.172	0.042	-0.664	-0,054
Sud-Ouest	0.222	0.049	0.364*	0.090	-0.588*	-0,049
Centre-Nord	-0.940***	-0.165	-0.865***	-0.188	-1.468***	-0,091
Centre-Ouest	-0.168	-0.035	-0.153	-0.036	-0.278	-0,026
Plateau Central	-0.054	-0.011	0.066	0.016	-1.573***	-0,093
Nord	0.189	0.041	0.261	0.064	-0.353	-0,032
Centre-Est	0.177	0.039	0.345**	0.085	-0.683**	-0,056
Centre	0.310*	0.068	-0.143	-0.034	0.296	0,031
Cascades	-1.055***	-0.177	-1.086***	-0.223	-0.634**	-0,053
Centre-Sud	-0.467***	-0.091	-0.397**	-0.092	-0.835**	-0,064
Constant		-4.699***		-4.842***		-4.063***
# observations	=	8276		5565		2644
Wald chi2	=	944.42		696.92		254.71
Prob > chi2	=	0.000		0.000		0.000

(*), (**) et (***) denote statistically significant coefficients at the 10%, 5% and 1% levels, respectively.

1.42 **The characteristics of the household head also appear to be important in explaining poverty.** While sex of the household head is not relevant, age however seems to have a significant effect, especially in rural areas. It is possible that, when work is physically demanding as with non-mechanized agricultural activities, age affects the strength and thus the productivity of the individual, which in turn can have a negative impact on household income. Regarding education, it proves to be negatively correlated with poverty. In fact, when the household head has primary education, this reduces the probability of households being poor by 5% when

compared to households whose head has no education. This reduction is 19% for secondary education. These effects remain significant in both rural and urban areas. As for marital status, households with a married polygamous head are 4% less likely to experience poverty compared to households with a married monogamous head. Recall that in the simple profiles, polygamous household heads were found to be poorer, but once we control for all the other correlates of poverty, the result is reversed, and this is one reason to look at these kinds of models. The other marital categories do not significantly affect poverty apart from the common-law status in the rural sample. The type of economic activity of the head seems also to be an important determinant. In comparison to heads working in the public sector, having a head working in other sectors (private sector, independent agricultural, other independent, unemployed and inactive) is associated with an increased probability of being poor. This effect is relatively high, ranging from 14% for the other independent category to 26% for the independent agricultural sector. The regression results by place of residence show, however, few differences, mainly in terms of statistical significance of coefficients.

1.43 Geographical characteristics also appear to be highly correlated with poverty. For example, households residing in urban areas are significantly less likely to be poor compared to rural households. This result is fairly standard in poverty profile analyses conducted in developing countries. Yet the analysis also reveals regional disparities. Indeed, when compared to the Hauts-Bassins region, those living in the regions of Boucle du Mouhoun, Sahel, Centre-Nord, Cascades and Centre-Sud are less poor by 6%, 14.5%, 16.5%, 17.7% and 9%, respectively. However, those living in the region of Centre face a 7% *higher* probability of being poor. The effects of living in other regions are not significant.

1.44 The analysis of the correlates of per capita expenditure, confirms the results obtained in the preceding poverty model. From the results presented in Table 1.9, all variables of composition and size of the household negatively and significantly affect per capita expenditure. The same is observed for the status of a household owning the dwelling. Unlike the case of the poverty model, where the sex of household head is not relevant, here the correlation is positive and significant if the household is headed by a woman. Education, marital status and type of activity of the head showed the expected signs and confirmed the results of the poverty model. The same observation can be made for geographical characteristics (place of residence and region).

Table 1.9: Estimation of correlates of log per capita household expenditure in Burkina Faso, 2009

	National		Rural		Urban	
	Coefficient	<i>t</i> -statistic	Coefficient	<i>t</i> -statistic	Coefficient	<i>t</i> -statistic
Composition and size of household						
household size	-0.030***	-11.260	-0.028***	-9.360	-0.050***	-8,730
% boys aged 0 - 5 years	-1.271***	-14.950	-1.253***	-11.980	-1.409***	-9,030
% boys aged 6 - 13 years	-1.254***	-16.960	-1.233***	-13.450	-1.333***	-10,230
% boys aged 14 - 17 years	-0.969***	-9.050	-0.988***	-7.790	-0.914***	-4,650
% girls aged 0 - 5 years	-1.354***	-15.930	-1.333***	-12.950	-1.463***	-9,270
% girls aged 6 - 13 years	-1.208***	-15.590	-1.264***	-13.250	-1.064***	-7,820
% girls aged 14 - 17 years	-0.865***	-7.140	-1.061***	-7.430	-0.548**	-2,320
% adult women	-0.259***	-3.460	-0.377***	-3.740	-0.223*	-1,940
Household dwelling status						
Household is homeowner	-0.059**	-2.180	-0.093**	-2.340	-0.080**	-2,090
Characteristics of the household head						
Sex (female = 1)	0.095**	2.590	0.038	0.910	0.230***	2,970
Age	-0.003***	-4.860	-0.005***	-6.930	0.004**	2,380
Primary education level	0.073***	2.910	0.048	1.610	0.133***	3,240
Secondary education	0.464***	11.330	0.231***	3.840	0.583***	11,280
Polygamous	0.065***	3.240	0.061***	2.790	0.136***	2,780
Common-law	-0.165***	-3.710	-0.120**	-2.240	-0.127*	-1,890
Single	-0.096*	-1.680	0.047	0.530	-0.144*	-1,830
Divorced	-0.093	-1.320	-0.115	-1.230	-0.188*	-1,890
Widower	-0.108***	-2.830	-0.034	-0.780	-0.270***	-3,450
Private sector	-0.258***	-4.230	-0.171	-1.350	-0.187***	-2,780
Independent agricultural	-0.533***	-9.930	-0.679***	-6.680	-0.487***	-7,420
Other independent	-0.318***	-5.800	-0.472***	-4.400	-0.206***	-3,250
Unemployed and inactive	-0.476***	-8.830	-0.632***	-6.050	-0.386***	-6,050
Geographical characteristics						
Urban	0.170***	7.290	-	-	-	-
Boucle du Mouhoun	0.054	1.460	-0.001	-0.020	0.251***	3,580
Sahel	0.219***	5.270	0.176***	3.650	0.238***	3,250
Est	-0.072**	-2.020	-0.128***	-2.980	0.064	0,940
Sud-Ouest	-0.148***	-3.770	-0.216***	-4.670	0.077	0,810
Centre-Nord	0.288***	7.630	0.249***	5.430	0.365***	5,400
Centre-Ouest	0.026	0.750	0.005	0.110	0.029	0,550
Plateau Central	-0.048	-1.370	-0.088**	-2.040	0.061	0,750
Nord	-0.071*	-1.870	-0.111**	-2.370	0.068	1,170
Centre-Est	-0.071**	-2.130	-0.146***	-3.440	0.140**	2,370
Centre	-0.144***	-4.050	-0.109	-1.520	-0.131***	-3,060
Cascades	0.215***	5.870	0.217***	4.700	0.143**	2,270
Centre-Sud	0.080**	2.330	0.052	1.250	0.030	0,390
Constant	13.487***	172.490	13.814***	115.160	13.283***	124,040
# observations =	8276		5565		2711	
R ² =	0.423		0.311		0.436	
F =	112.19		54.23		45.20	

(*), (**) et (***) denote statistically significant coefficients at the 10%, 5% and 1% levels, respectively.

F. CONCLUSION

1.45 This note shows that in the past decade, Burkina Faso has enjoyed a respectable 5% real GDP growth per year, within a stable macroeconomic environment characterized by low inflation. This has led to increased per capita incomes, downward trends in poverty and inequality levels and significant improvements in social indicators.

1.46 **Notwithstanding these major improvements, headcount poverty was still around 47 percent in 2009.** Furthermore, there remains large regional inequality and disparities between rural and urban areas. For example, in 2009, 8 out of 10 poor people still lived in rural areas where close to 76 percent of the population still live, underscoring the monumental work that is needed to make further progress on poverty reduction in Burkina Faso.

1.47 **In addition to the evolution of poverty the report also provides a profile of the poor.** It finds that the highest poverty rates are found among large families, residents in rural areas and Northern and Eastern parts of the country (especially the Regions Est, Nord, and Sahel) and those with very low skills. On the basis of the diagnosis, implied policy recommendations will favor sustaining the growth, improving rural productivity and undertaking social inclusion programs for lagging regions.

1.48 **At the center of these diagnostics and conclusions are the available household survey data in Burkina Faso.** As noted above, Burkina Faso has conducted numerous surveys – at least 6 – between 1994 and 2009. Seen from afar this information can be seen as having the potential to be the foundations for monitoring poverty and social outcomes and for evaluating progress made on policy interventions. Such evaluations can be important for evidence-based policy making. However, there is a cloud that hangs over these surveys and indeed results obtained from using these micro-surveys. In our view two major problems stand out. First, the surveys are not comparable. The many ways in which they are not comparable is documented under section “B. Data and methodology,” so, details are not necessary to repeat here. Suffice it to say, they involve a choice of diary versus recall, the time of year to conduct the surveys and the list of items to include in the consumption module. Second, the surveys are conducted with long lags. Often the time in-between surveys lasts 4 to 6 years in large part because of reliable financing. The irregularity of survey implementation and data availability combined with problems of comparability creates hurdles in the way of learning about changes over time.

1.49 **To strengthen the foundation of poverty monitoring and evidence policy making in Burkina Faso we recommend the following:** (a) use the EICVM 2009 as the basis any future survey of its kind. The EICVM 2009 is the most comprehensive and most well-designed in the list of surveys. It can anchor future surveys once some of the problems in the last round are corrected and streamlined; (b) the government should commit to financing core surveys, to assure sustainability, accountability for quality and ownership; (c) reduce the periodicity of the survey rounds. If repeating the survey each year is not possible, then perhaps 2-3 year cycle should be considered; (d) complement the complex integrated survey with a more frequent and light data collection system that could use modern devices such as cell phones or tablets.

Annexes

Table A1.122: Estimation of correlates of poverty in Burkina Faso, 2003

	National		Rural		Urban	
	Coefficient	Marginal effect	Coefficient	Marginal effect	Coefficient	Marginal effect
Composition and size of household						
household size	0.141***	0.035	0.145***	0.034	0.154***	0.019
% boys aged 0 - 5 years	3.035***	0.759	3.067***	0.725	2.670***	0.332
% boys aged 6 - 13 years	2.560***	0.640	2.504***	0.592	2.817***	0.350
% boys aged 14 - 17 years	2.096***	0.524	1.998***	0.473	2.475***	0.307
% girls aged 0 - 5 years	3.067***	0.767	3.002***	0.710	3.686***	0.458
% girls aged 6 - 13 years	2.582***	0.645	2.385***	0.564	3.645***	0.453
% girls aged 14 - 17 years	1.474***	0.368	1.656***	0.392	0.457	0.057
% adult women	0.701**	0.175	0.768**	0.182	0.621	0.077
Household dwelling status						
Household is homeowner	0.250**	0.062	0.314**	0.076	0.132	0.016
Characteristics of the household head						
Sex (female = 1)	0.017	0.004	0.029	0.007	-0.019	-0.002
Age	0.016***	0.004	0.016***	0.004	0.015**	0.002
Primary education level	-0.348***	-0.087	-0.328**	-0.080	-0.473***	-0.053
Secondary education	-1.213***	-0.280	-0.942***	-0.231	-1.494***	-0.160
Polygamous	-0.163**	-0.041	-0.164*	-0.039	-0.203	-0.024
Common-law	-0.88	-0.022	-0.017	-0.004	0.011	0.001
Single	-0.113	-0.028	-0.124	-0.030	0.071	0.009
Divorced	0.038	0.010	-0.115	-0.028	0.392	0.055
Widower	-0.094	-0.023	-0.213	-0.051	0.312	0.042
Private sector	1.033***	0.239	1.013**	0.201	1.091***	0.169
Independent agricultural	1.643***	0.379	1.466***	0.350	2.100***	0.378
Other independent	0.917***	0.217	0.948**	0.192	0.792***	0.112
Unemployed and inactive	1.155***	0.264	1.176***	0.228	0.946***	0.145
Geographical characteristics						
Urban	-0.489***	-0.121	-	-	-	-
Boucle du Mouhoun	-0.172	-0.043	-0.139	-0.033	-0.093	-0.011
Sahel	-0.559***	-0.137	-0.512***	-0.125	0.146	0.019
Est	-0.430***	-0.106	-0.306**	-0.074	-1.413***	-0.108
Sud-Ouest	0.487***	0.119	0.624***	0.135	-0.954	-0.085
Centre-Nord	-0.677***	-0.165	-0.539***	-0.132	-1.715***	-0.120
Centre-Ouest	-0.442***	-0.109	-0.339**	-0.082	-0.795***	-0.077
Plateau Central	0.593***	0.144	0.698***	0.150		
Nord	0.917***	0.217	1.002***	0.205	0.747***	0.115
Centre-Est	0.203	0.050	0.332**	0.076	-0.423	-0.046
Centre	-0.203*	-0.051	0.652**	0.140	-0.590***	-0.072
Cascades	-0.138	-0.035	-0.063	-0.015	-0.243	-0.028
Centre-Sud	0.622***	0.151	0.723***	0.154		
Constant	-4.282***		-4.319***		-4.637***	
# observations	=	8491	5893		2598	
Wald chi2	=	1618.63	883.38		506.10	
Prob > chi2	=	0.000	0.000		0.000	

(*), (**), (***) denote statistically significant coefficients at the 10%, 5% and 1% levels, respectively.

Table A1.2: Estimation of correlates of log per capita household expenditure in Burkina Faso, 2003

	National		Rural		Urban	
	Coefficient	<i>t</i> -statistic	Coefficient	<i>t</i> -statistic	Coefficient	<i>t</i> -statistic
Composition and size of household						
household size	-0.109***	-32.630	-0.104***	-27.760	-0.129***	-21.190
% boys aged 0 - 5 years	-0.780***	-13.580	-0.889***	-13.510	-0.363***	-2.800
% boys aged 6 - 13 years	-0.981***	-18.040	-1.044***	-16.540	-0.828***	-6.930
% boys aged 14 - 17 years	-0.880***	-10.900	-0.949***	-9.850	-0.629***	-3.880
% girls aged 0 - 5 years	-0.910***	-16.000	-1.021***	-15.800	-0.500***	-3.820
% girls aged 6 - 13 years	-0.967***	-17.070	-1.045***	-15.840	-0.772***	-6.700
% girls aged 14 - 17 years	-0.646***	-8.900	-0.655***	-7.840	-0.647***	-3.740
% adult women	-0.286***	-4.910	-0.315***	-4.280	-0.209**	-2.090
Household dwelling status						
Household is homeowner	-0.101***	-5.310	-0.054**	-2.280	-0.096***	-3.010
Characteristics of the household head						
Sex (female = 1)	0.167***	4.820	0.225***	5.490	0.045	0.700
Age	-0.003***	-6.640	-0.003***	-7.020	-0.002	-1.530
Primary education level	-0.068***	-3.540	-0.048**	-2.270	-0.076**	-2.100
Secondary education	-0.024	-0.910	-0.016	-0.370	-0.046	-1.230
Polygamous	-0.023	-1.480	-0.045***	-2.630	0.059	1.360
Common-law	0.101**	2.130	0.002	0.040	0.135**	2.030
Single	0.234***	6.550	0.133***	2.970	0.376***	6.090
Divorced	0.166***	2.810	0.125*	1.670	0.249***	2.710
Widower	0.194***	5.560	0.227***	5.650	0.133*	1.950
Private sector	0.047	1.270	0.021	0.350	-0.011	-0.250
Independent agricultural	-0.036	-1.070	-0.094*	-1.730	0.006	0.120
Other independent	-0.023	-0.650	-0.138**	-2.370	-0.005	-0.110
Unemployed and inactive	-0.068*	-1.850	-0.122**	-2.020	-0.048	-0.970
Geographical characteristics						
Urban	0.289***	14.280	-	-	-	-
Boucle du Mouhoun	-0.009	-0.390	0.073***	2.810	-0.413***	-8.100
Sahel	-0.079***	-3.640	-0.016	-0.710	-0.236***	-2.890
Est	-0.176***	-8.010	-0.119***	-5.190	-0.373***	-4.360
Sud-Ouest	-0.214***	-8.880	-0.162***	-6.510	-0.423***	-3.250
Centre-Nord	0.250***	11.050	0.297***	12.430	0.152**	2.230
Centre-Ouest	-0.104***	-4.350	-0.043*	-1.640	-0.268***	-4.600
Plateau Central	-0.085***	-2.930	-0.042	-1.420		
Nord	-0.076***	-3.330	-0.016	-0.650	-0.255***	-4.620
Centre-Est	-0.171***	-7.310	-0.142***	-5.690	-0.143**	-2.330
Centre	-0.142***	-5.330	-0.228***	-5.580	-0.187***	-4.910
Cascades	0.056*	1.650	0.116***	3.090	-0.101	-1.390
Centre-Sud	-0.080***	-2.920	-0.034	-1.190		
Constant	13.542***	265.180	13.534***	198.360	13.872***	144.090
# observations	=	8491		5893		2598
R ²	=	0.675		0.712		0.525
F	=	349.06		278.54		74.68

(*), (**) et (***) denote statistically significant coefficients at the 10%, 5% and 1% levels, respectively.

A1. The reweighting approach estimation

The reweighting approach is motivated by Tarozzi (2007). To start, consider the EBCVM 2003 as the targeted survey (one where we do not have the right information) and the EICVM 2009 as the auxiliary one. Let y be the variable of interest (household's total expenditures) which is suitably measured in EICVM and differently measured in EBCVM. Assume there are several auxiliary variables x that can be used as proxies for the unobserved y from EBCVM. Unfortunately, due to the different approach used to collect consumption information in 2003, we observe \tilde{y}_{2003} rather than y_{2003} . Consider a binary variable D which takes the value 0 in 2009 and the value 1 in 2003. We then observe the pairs (y_{2009}, x_{2009}) when $D = 0$ and $(\tilde{y}_{2003}, x_{2003})$ when $D = 1$. Tarozzi (2007) defines the following population moment condition:

$$E[nf(y; \phi_0) | D = 1] = 0 \quad (\text{A1.1})$$

In this case where one is interested in estimating poverty, n is the household size and ϕ_0 the FGT (Foster-Greer-Thorbecke) poverty index. For example, with $\alpha = 0$, ϕ_0 is the poverty headcount while it represents the poverty gap for $\alpha = 1$.

It is assumed that the set of auxiliary variables are distributed according to $dP(x)$. Now, assume the following conditions:

$$(C1) \quad dP(x_{2003} | D = 1) = dP(x_{2009} | D = 1)$$

$$(C2) \quad E[f(y_{2009}; \phi_0) | x_{2009}, D = 1] = E[f(y_{2009}; \phi_0) | x_{2009}, D = 0]$$

$$(C3) \quad dP(x_{2009} | D = 1) \text{ is absolutely continuous with respect to } dP(x_{2009} | D = 0)$$

$$(C4) \quad \text{supp}(x_{2009} | D = 1) \subseteq \text{supp}(x_{2009} | D = 0)$$

If the above conditions hold, then ϕ_0 satisfies the modified population moment condition which follows:

$$E[nW(x)f(y; \phi) | D = 0] = 0 \quad (\text{A1.2})$$

$W(x)$ is then the reweighting function obtained from the following expression:

$$W(x) = \frac{dP(x | D = 1)}{dP(x | D = 0)} = \frac{P(D = 1 | x)P(D = 0)}{P(D = 0 | x)P(D = 1)} \quad (\text{A1.3})$$

A2. The poverty map approach estimation

This method is based on Elbers, Lanjouw and Lanjouw (2003). The first step is to estimate the following model:

$$\ln y_{ch} = X'_{ch}\beta + u_{ch}, \quad (\text{A2.1})$$

with:

$c \rightarrow$ the cluster subscript

$h \rightarrow$ the subscript representing the household within cluster

$y_{ch} \rightarrow$ the expenditure per capita for household h in cluster c

$X_{ch} \rightarrow$ a set of characteristics of household h in cluster c

The error term u_{ch} can be decomposed as follows:

$$u_{ch} = \eta_c + \varepsilon_{ch} \quad (\text{A2.2})$$

η_c captures the cluster effect while ε_{ch} represents household component. The variance of the cluster effect η_c is given by Elbers et al (2001):

$$\text{Var}(\hat{\sigma}_\eta^2) = \sum_c \left[a_c^2 \text{Var}(u_c^2) + b_c^2 \text{Var}(\hat{\tau}_c^2) \right] \quad (\text{A2.3})$$

The results obtained from the above steps are used to simulate the consumption variable for 2003. More precisely, the following model is used:

$$\ln \tilde{y}_{ch} = X'_{ch}\tilde{\beta} + \tilde{\eta}_c + \tilde{\varepsilon}_{ch}, \quad (\text{A2.4})$$

where $\tilde{\beta} \sim N(\hat{\beta}, \hat{\Sigma}_\beta)$, $\tilde{\eta}_c$ a random variable that follows the normal distribution with variance $\text{Var}(\hat{\sigma}_\eta^2)$ given in the Equation (A2.3). $\tilde{\varepsilon}_{ch}$ is also a random variable with known variance.

Table A1.3: Selection of the variables used for consumption model

Groups of variables	Definition
Characteristics of the head of household	Age, sex, education level, marital status, employment sector
Demographic characteristics of household	Household size, variables of household composition
Geographical characteristics	Place of residence, regions
Assets	Radio, television, car, motorbike, bike, refrigerator, sewing machine, iron, stove, bed mattresses, cart
Dwelling and comfort	Ownership of the dwelling, roof and wall quality, access to water, to electricity, to sanitation, to phone
Food security	Ability to meet food needs