Essay 1

A Growth-Poverty-Paradox?

There are no facts, only interpretations.
Friedrich Nietzsche, 1844-1900

Abstract: It is a stylized fact, that some countries do not show significant poverty reduction despite considerable growth rates, whereas others succeed in reducing poverty with only moderate or even negative growth rates. In this paper we ask the question whether part of this missing link between growth and poverty can be explained by sole survey and data inconsistencies, with an empirical illustration for Burkina Faso. We show that previous poverty assessments of Burkina Faso neglected some important survey and data issues which led to the so-called 'Burkinabè Growth-Poverty-Paradox' in the 1990s, with increasing poverty rates despite sustained macro-economic growth and stagnant inequality. Our revised estimates indicate that poverty significantly decreased between 1994 and 2003, i.e. growth did - in contrast to what previous poverty estimates suggested - significantly reduce poverty.

based on joint work with Michael Grimm.
1.1 Introduction

In the last decade, an extensive literature on the empirical relationship between growth and poverty, i.e. the impact of macro-economic growth on micro-economic poverty reduction has emerged (e.g. Dollar and Kray, 2002; Ravallion, 2001; Ravallion and Chen, 1997). One stylized fact of this empirical literature seems to be that on average ‘growth is good for the poor’ (Dollar and Kray, 2002) with growth on average leading to considerable poverty reduction, with an average estimated growth elasticity of poverty of -2 (for an overview see Ram, 2006), but with country specific elasticities lying anywhere between about -5 and 5 (Figure 1.1).

Figure 1.1: Growth-Elasticity of Poverty in the 1990’s

\[
\text{Proportional change in poverty rate (\$1/day)}
\]

\[
\text{Proportional change in survey mean}
\]


In response to the observed cross-country heterogeneity in growth elasticities of poverty, several studies have tried to explain the diverse impact of growth on poverty reduction. This literature can broadly be divided into theoretically motivated and policy-motivated studies.

The former argues that a large part of the differences in growth elasticities of poverty across countries can already be explained theoretically by an ‘identity’ linking growth to poverty reduction (Bourguignon, 2003; Klasen and Misselhorn, 2006). More precisely, the growth elasticity of poverty of a given country is a
function of (i) the initial inequality, (ii) the initial development level, and (iii) the change in inequality of a country (Bourguignon, 2003).

The latter, mainly policy-motivated literature, tries to identify the main national as well as international policies that have increased (or decreased) the impact of growth on poverty reduction in the last decade (see e.g. Dorward et al., 2004; Kray, 2003; Lopez, 2003; Ravallion and Datt, 1999 or the ‘Operationalizing Pro-Poor Growth’ (OPPG) Research Program of the World Bank).

In this paper we make a third attempt to explain the diverse experience of countries, namely attributing part of the observed heterogeneity of growth elasticities of poverty to significant survey and data inconsistencies over time that exist not only between countries but also within countries. One interesting case in point here is Burkina Faso.

Burkina Faso is still one of the poorest countries in the world, with a Gross Domestic Product (GDP) per capita of 384 USS PPP (IMF, 2005) and a Human Development Index (HDI) rank of 174 out of 177 countries (UNDP, 2005). However, according to National Accounts (NA) data, Burkina Faso has experienced relatively strong economic growth over the last decade. After the devaluation of the Franc de la Communauté Financière d’Afrique (CFA-Franc) in January 1994, real GDP per capita began to rise, with an average of 2 percent growth per year.²

According to the International Monetary Fund (IMF) this good economic performance is, first of all, the result of the gains in competitiveness following the devaluation of the CFA-Franc, the large public investment program (mainly externally financed), and the financial and structural policies (including price and trade liberalization) within the framework of structural adjustment programs (SAP), aimed at consolidating the market orientation of the economy and maintaining macro-economic stability (IMF, 2003).

Despite the considerable macro-economic growth in the last years the micro-economic performance has so far been rather disappointing. Official poverty estimates, including those of the Burkinabé Statistical Office, the World Bank, and the

¹Here, the development level of a country is defined as the location of the poverty line relative to mean income.

²Source: Instrument Automatisé de Prévision (IAP). This is a macro-economic framework based on NA data developed by the Burkinabé Ministry of Economy and Development with technical assistance of the German Gesellschaft für Technische Zusammenarbeit. It is considered as the most reliable macro-economic data source in Burkina Faso.
United Nations Development Program (UNDP), all derived from 1994, 1998, and 2003 household survey data, indicated that the poverty headcount index stagnated at a high level of roughly 45 percent between 1994 and 2003, implying that the growth elasticity of poverty was zero (Fofack et al., 2001; INSD, 2003; Lachaud, 2003).

The simultaneous occurrence of strong positive growth and stagnating poverty rates suggests that inequality increased significantly during this period. However, according to the official estimates inequality remained constant with a Gini coefficient of 0.46. This led to the so-called ‘Burkinabè Growth-Poverty-Paradox’, with increasing poverty rates despite sustained macro-economic growth and constant inequality rates.

Several explanations might be given for this ‘paradox’. First, macro-economic growth might have been completely disconnected from households’ expenditures: the ‘missing link’ hypothesis. In other words increases in GDP per capita were mainly driven by enterprise benefits, investments, government consumption or by increases in consumption of rather few agents not necessarily covered by household surveys and/or went outside the country. Second, it is also possible that macro-economic growth was simply over-estimated. In many developing countries, and Burkina Faso is no exception, it is very hard to obtain reliable statistics on sector-specific value added and population growth.

However, between 1994 and 2003 not only GDP per capita, but also official estimates of private consumption per capita as measured in the National Accounts (NA) and as measured in the household surveys showed considerable (and quite similar) annual growth rates. Between 1994 and 2003 GDP per capita grew annually by 2.3 percent, private per capita consumption in the NA increased by 3.1 percent, and per capita consumption in the household surveys by 2.5 percent. Thus neither the ‘missing link’ hypothesis nor over-estimated macro-economic growth seems to be the cause for a zero growth elasticity of poverty between 1994 and 2003 in Burkina Faso.

Hence, a third point, concerning several methodological issues related to micro-economic survey design and poverty analysis, leading to time-inconsistent poverty...
estimates, might be largely responsible for the Growth-Poverty-Paradox. The aim of this paper is, hence, to discuss and analyze these methodological problems in detail, to address them, and to offer a new growth, poverty, and inequality assessment for Burkina Faso. These new estimates do certainly not perfectly reflect the welfare changes that occurred in Burkina Faso between 1994 and 2003, but should constitute a considerable improvement to previous official poverty estimates.

We believe that most of the methodological problems discussed in this paper are not country-specific to Burkina Faso but should arise in other (least developed) countries as well. Hence, we think that this paper can also contribute to the current debate on the driving forces behind the heterogeneity of growth elasticities of poverty across countries. We therefore review some simple procedures to test and tackle the problem of inconsistent micro-economic data to estimate more reliable growth elasticities of poverty.

The paper is organized as follows. In Section 1.2, we shortly describe the recent economic development in Burkina Faso and explain in detail the ‘Burkinabé Growth-Poverty-Paradox’. In Section 1.3, we analyze and address the ‘paradox’ by computing more time-consistent poverty and inequality estimates, which are presented in section 1.4. In Section 1.4, we furthermore undertake a robustness check of our new poverty and inequality estimates and present revised monetary (and non-monetary) growth elasticities of poverty. We conclude in Section 1.5.

1.2 The Paradox

Figure 1.2 shows the development of real GDP per capita between 1990 and 2003 in Burkina Faso. With the beginning of structural adjustment programs in 1991 real GDP per capita began to decline by approximately -3.8 percent per year until 1993. Then in 1994, the failure of the structural adjustment strategy in several countries of the CFA-Franc zone, and especially in one of the most important ones, Côte d’Ivoire, led to a 50 percent devaluation of the CFA-Franc parity in relation to the French Franc. After the devaluation - due to gains in competitiveness -

---

3Variations in the purchasing power of the poor relative to the non-poor in connection with an only weak integration of poor households into the macro-economic growth process solve the remaining part of the ‘paradox’.
growth of real GDP per capita began to rise and averaged at approximately 3.3 percent per year between 1994 and 1998. This growth was further sustained by a favorable development of the world market price for cotton and an increase of the area used for cotton production.

Real GDP per capita decreased in 1998 and stagnated in 2000 due to two consecutive years of drought but reached again a growth rate of around 2 percent in the following years. Since 2002 Burkina Faso has been affected by the Ivorian crisis (i.e. less trade with Côte d'Ivoire, higher transportation costs, immigration and lower private remittances), but growth in 2003 was still estimated at 6.8 percent. This was mainly due to a very good harvest in 2002/03 and a relatively fast reorganization of the country's import and export channels (AFD, 2003). Over the whole observation period 1994-2003, Burkina Faso pursued its efforts to undertake structural reforms, in particular price and trade liberalization. In May 2000, Burkina Faso established its first Poverty Reduction Strategy Paper (PRSP) and reached its completion point in the Heavily Indebted Poor Countries (HIPC) Initiative II in April 2002.

Given this overall good growth performance between 1994 and 2003, even if interrupted by two severe droughts, we would have expected a substantial decrease in poverty in Burkina Faso since 1990. Table 1.1 presents the official poverty and
inequality estimates as presented in 2003 by the Burkinabé Statistics Office, by the Institut National de la Statistique et de la Démographie (INSD), by the UNDP and (for the period 1994 to 1998) also by the World Bank. Poverty is measured as the headcount index of poverty, which is equivalent to \( P_0 \) of the Foster-Greer-Thorbecke Poverty Measure \( P_\alpha \), where \( \alpha \) is a parameter of inequality-aversion (Foster et al., 1984). In addition, Table 1.1 presents the official estimates for \( P_1 \) - yielding the depth of poverty - and \( P_2 \) - referring to the severity of poverty. Income (i.e. consumption) inequality is measured with the Gini Index, which can take any value between zero and one. Zero refers to 'perfect' equality with everyone having the same (mean) income within a country. One refers to 'perfect' inequality with all income within a country accruing to one person, and everyone else having zero income.

The figures in Table 1.1 indicate that, despite good macro-economic performance, poverty did not decrease but stagnated at a level of roughly 45 percent between 1994 and 2003. A simultaneous occurrence of economic growth and poverty stagnation would suggest that inequality increased during the observed period. But inequality was estimated with a Gini coefficient of around 0.46 over the whole period leading to the 'Burkinabé Growth-Poverty-Paradox'.

Table 1.1 also shows the official poverty line used for the computation of the poverty indices. The massive increase of the nominal poverty line between 1994 and 1998 and the still strong increase between 1998 and 2003 is striking. Whether this considerable nominal increase of the poverty line over time can be justified by the rise of the cost-of-living of the poor and how that relates to the development of the national Consumer Price Index (CPI) will be analyzed in detail in next section. We will show that the poverty line used in official estimates already explains a large part of the 'paradox'.

---

4 The estimates are based on three national representative household surveys, the Enquête Prioritaires (EP), undertaken in 1994 (EPI), 1998 (EPII), and 2003 (EPIII). These surveys are similar to the World Bank's Living Standard Measurement Surveys (LSMS). In each survey round, the sample size was roughly 8,500 households and 60,000 individuals (without a panel dimension).

5 \( P_0 \), or the headcount index, measures the percentage of the population living below the poverty line. \( P_1 \), or the poverty gap, is a measure of the average difference between income and the poverty line, with the difference for the non-poor set to zero. \( P_2 \), or the severity of poverty, also takes into account the inequality among the poor.
Table 1.1: Poverty and Inequality Trends - Official Estimates

<table>
<thead>
<tr>
<th></th>
<th>Urban</th>
<th>Rural</th>
<th>National</th>
</tr>
</thead>
<tbody>
<tr>
<td>P0</td>
<td>10.4 16.5 19.9</td>
<td>51.0 51.0 52.3</td>
<td>44.5 45.3 46.4</td>
</tr>
<tr>
<td>P1</td>
<td>2.5 4.0 –</td>
<td>15.7 –</td>
<td>13.9 13.7 15.6</td>
</tr>
<tr>
<td>P2</td>
<td>0.9 1.5 –</td>
<td>6.0 –</td>
<td>6.0 5.9 7.1</td>
</tr>
<tr>
<td>Gini</td>
<td>0.45 0.51 0.49</td>
<td>0.38 0.39 0.46</td>
<td>0.46 0.46 0.46</td>
</tr>
</tbody>
</table>

41,099(100.0) 72,690(176.9) 82,672(201.2)

Notes: P0: poverty headcount. P1: poverty gap. P2: poverty severity. Gini: measure of inequality. No official estimates for P1 and P2 for urban and rural areas were provided in 2003. The national poverty line (PL) is expressed on a yearly per capita basis in current CFA prices. The Gini coefficient is population weighted.

1.3 Biased Poverty Estimates

In this section we argue that previous poverty assessments were seriously biased by three micro-economic methodological inconsistencies: an inconsistent poverty line over time, changes in the methodology used to compute household expenditure aggregates, and, to a lesser extent, changes in the household survey design (see Table 1.2 for an overview).

1.3.1 Poverty Line

Figure 1.3 shows that the official poverty line increased much more than the CPI between 1994 and 2003, implying that the ‘prices of the poor’ used for the computation of the poverty line increased more than the prices of goods consumed by the ‘representative urban household’ used for the computation of the CPI. More precisely, the national poverty line increased by 76.9 percent between 1994 and 1998 and by 13.7 percent between 1998 and 2003, whereas the national CPI increased by only 22.7 percent and 7.1 percent, respectively. Given that the location of the poverty line (over time) highly influences an assessment of poverty dynamics, we need to analyze whether this high inflation of the poverty line is indeed justified.
There is no doubt that a poverty line should be composed of a higher ‘basic’ food component than the national CPI which usually reflects the consumption habits of an ‘average’ household rather than the budget shares of the poor. Indeed, Burkina Faso’s official poverty lines in all three years (1994, 1998, and 2003) have a basic food component of more than 50 percent whereas the national CPI only has a food component of 10 percent. Hence, the poverty line cannot simply be inflated with the CPI if relative prices of basic food items changed over time.

In Burkina Faso, the CPI increased by only 22.7 percent between 1994 and 1998 whereas prices for cereals (for example millet and sorghum) more than doubled during the same period. Between 1998 and 2003 the CPI further increased while cereal food prices decreased (Figure 1.3). The inflationary surge of staple prices between 1994 and 1998 was mainly due to a severe drought in 1997/98 which reduced cereal production in this season by more than 20 percent with re-

---

6Note that an ‘average’ household is not the same as a ‘representative’ household, i.e. the CPI reflects the consumption habits of an ‘average’ household but is in general ‘representative’ for a rather rich household.

7See also Essay 2.
spect to 1996/97. In addition, prices were driven by a general lack of productivity increase accompanied by high population growth.

Hence, the sharp inflation of the official poverty line between 1994 and 1998 is indeed justified given the massive price increase of cereals and given the consumption pattern of the poor. However, the further inflation of the poverty line between 1998 and 2003 cannot be justified by observed relative price changes, and was actually caused by a change of the underlying consumption basket (see also Table 1.2).

Table 1.2: Survey and Data Inconsistencies

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Poverty Line</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indexed Food Component</td>
<td>-</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Indexed Non-Food Component</td>
<td>-</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>Non-Food/Food</td>
<td>0.32</td>
<td>0.39</td>
<td>1.01</td>
</tr>
<tr>
<td>Welfare Aggregate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rents Missing</td>
<td>0.22</td>
<td>0.16</td>
<td>0.06</td>
</tr>
<tr>
<td>Durables</td>
<td>not included</td>
<td>included</td>
<td>included</td>
</tr>
<tr>
<td>Adjustment to NA</td>
<td>no</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Survey Design</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Survey Period</td>
<td>Oct-Jan</td>
<td>May-Aug</td>
<td>Apr-Jul</td>
</tr>
<tr>
<td>Recall Period Food</td>
<td>30 days</td>
<td>15 days</td>
<td>15 days</td>
</tr>
<tr>
<td>Consumption Items</td>
<td>50</td>
<td>70</td>
<td>80</td>
</tr>
</tbody>
</table>

Source: EPI, EPII, EPIII.

More precisely, the official poverty line in 1994, 1998, and 2003 was based on the price of a 2,283 calorie food intake composed of millet, sorghum, maize, and rice, which are the main components of nutrition intake for poor people in Burkina Faso. Whereas this real food component was appropriately inflated with the respective price index over time, the non-food component was not inflated over time with the respective non-food price index, but was simply calculated as a share of the nominal food component, i.e. implicitly inflated with the food price index.

8Estimates are based on the agricultural survey, the Enquête Permanente d'Agricole, which is undertaken on a yearly basis in Burkina Faso.
Moreover, the ratio of the non-food to the food component was even altered over time. Whereas the non-food component was calculated, taking approximately 30-40 percent of the nominal non-food component in 1994 and 1998, in 2003 the non-food component was calculated taking 100 percent of the nominal food component.

This implies that both the inflation of the poverty line between 1994 and 1998 as well as between 1998 and 2003 was overestimated. Between 1994 and 1998 basic food prices increased much more than prices of other goods. Hence, implicitly inflating the non-food component with the food price index between 1994 and 1998 overestimates poverty in 1998 relative to 1994. Between 1998 and 2003 relative price changes between food and non-food items were less severe. However, now the massive increase of the non-food component (in relation to the nominal food component) induced again an upward bias of the nominal poverty line in 2003.

In other words, the price index implicit in the official poverty line does not correspond to a true Laspeyres (or Paasche) Index. Therefore, we suggest computing a new and more appropriate poverty line using constant real weights of food and non-food items over the period 1994 to 2003.

To compute such a time-consistent poverty line, we took the nominal value of the official poverty line in 2003, and the budget shares as they are observed in the household survey among households living below this line in 2003. The food crop component (consisting of maize, millet, sorghum, and rice) was then deflated to 1998 and to 1994 using the observed price changes for the corresponding cereals. The remaining food and non-food component was deflated with the CPI, with the price change of food crops netted out.\(^9\)

We chose 2003 as the ‘base’ year for the poverty line and the estimated budget shares to be consistent with the latest official poverty estimates in Burkina Faso. Hence, in this application we preferred a Paasche Index to a Laspeyres Index mainly because of political reasons.\(^10\) However, we also used the official poverty line and the budget shares among the poor of 1994 or 1998 as reference points.

---

\(^9\)We applied monthly-specific price indices. More precisely, we took the average prices of the respective four-months survey periods in 1994, 1998, and 2003.

\(^{10}\)See also Essay 2.
to check the robustness of our results to a Laspeyres Index. We found the same poverty trends, only on a lower level.

There are several other methods to construct a national poverty ‘baseline’ to be in- or deflated over time. All of them involve some ‘arbitrariness’, but the probably most often used method for developing countries is based on a ‘costs of basic needs’ approach. First, the cost of a 2100-2300 calorie intake per capita,\footnote{11 The reference group is some cut-off of the lower-part of the expenditure distribution.} which is widely considered as the minimum calorie intake of an individual (Deaton, 1997), is calculated. In general, this cost is defined as the food poverty or extreme poverty line. In a second step, the non-food component of the ‘costs of basic needs’ can be derived by calculating the food expenditure that households - whose total expenditure is equal to the food poverty line - are willing to give up for non-food consumption. This share of non-food consumption is added to the food poverty line to calculate the national poverty line. An alternative is to define the poverty line as the total expenditure of households that spend exactly the amount calculated in step one on food items.

We did not intend to derive a new more ‘precise’ poverty line, but rather to appropriately in- or deflate poverty lines over time, or in other words we were more interested in the budget shares of the poverty line than in the poverty line itself. Hence, to be consistent with the latest poverty line constructed by the Burkinaf
de Statistical Office - the INSD - we used the official poverty line of 2003 and calculated the average budget shares of the people living below this line to be deflated with the appropriate price indices. Thus, we did not calculate budget shares to construct a poverty line but used the poverty line to construct budget shares. Our approach should lead to an estimated food share that lies somewhere between the food share of poverty lines that are constructed with one of the two above described methods of the ‘cost of basic needs’ approach.

The revised poverty lines, which are presented in Table 1.3, show a somewhat lower inflation rate between 1994 and 1998 and a much lower inflation rate between 1994 and 2003 than the official poverty line.
1.3. BIASED POVERTY ESTIMATES

Table 1.3: Official and Revised Poverty Lines

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Official Poverty Line</td>
<td>41,099 (100.0)</td>
<td>72,690 (176.9)</td>
<td>82,672 (201.2)</td>
</tr>
<tr>
<td>Revised Poverty Line</td>
<td>43,219 (100.0)</td>
<td>82,885 (155.7)</td>
<td>82,672 (155.3)</td>
</tr>
</tbody>
</table>

Notes: Both poverty lines are expressed on a yearly per capita basis in current CFA prices. The implicit price index of the poverty line is expressed in parenthesis (1994=100).

1.3.2 Welfare Aggregate

All previous studies on the development of poverty in Burkina Faso used the same household expenditure aggregate. This aggregate was provided by the INSD in addition to the raw data of the household surveys. However, this aggregate was based on some assumptions which differ from the assumptions usually made when constructing household expenditure aggregates for poverty analysis. In addition, some of the necessary assumptions were not maintained in a consistent way over time. These biases and inconsistencies were recently also recognized by the World Bank and discussed in their 2004 poverty assessment (World Bank, 2004). It should however be emphasized that the INSD first of all tried to provide current ‘snap-shot’ poverty estimates and less a comparison over time, explaining why some inconsistent assumptions might have been made.

First, usually hypothetical rents for those households which own their housing are imputed (Deaton and Zaidi, 2002). Not doing so would underestimate the wellbeing of these households relative to those households who rent their housing. In Burkina Faso, roughly 90 percent of all households do not pay any housing rent. However, the official expenditure aggregate contains imputed values only for some house owners and they are missing for 22, 16, and 6 percent of all households in 1994, 1998 and 2003 respectively. This implies that poverty was always overestimated, but less so from year to year. We corrected this bias by imputing rents for all households where rents were not declared or not yet imputed.12

12 We applied average regional urban and rural rents as a hedonic regression on rents did not yield any applicable results.
Second, usually expenditures for durables such as televisions, radios, refrigerators, motorcycles, bicycles, cars, or investments into housing, land, and livestock are not included in a welfare aggregate which is constructed to measure consumption and poverty for a given period of time, e.g. a year. The argument is that the utility drawn from durables concerns not only the period under consideration but also subsequent periods (Deaton and Zaidi, 2002). Given the lack of information allowing to divide the utility over the relevant periods or to compute appropriate user costs, expenditures for durables are usually excluded in poverty analysis. However, these expenditures were included in 1998 and 2003 with their total purchasing price, but were not included in 1994 in the Burkinabé welfare aggregate. Although this does not severely bias poverty estimates, as most durables are purchased by rather rich households, it does increase inequality measures. To redress this bias, we excluded expenditures for durables from the expenditure aggregates in 1998 and 2003.

Third, in 1998 the official expenditure aggregate was uniformly increased for all households by 12.4 percent. The reason for this adjustment is not well documented, but it seems that this was done to obtain a household expenditure aggregate closer to the National Accounts expenditure aggregate. Such an uniform adjustment can only hardly be justified, even more if it is only undertaken for one particular survey year. This adjustment clearly led to a substantial underestimation of poverty in 1998. In our estimates we did not follow such an adjustment, neither for 1998 nor for any other year.

In addition to the above described corrections, we applied regional deflators provided by the INSD to account for regional differences in the cost-of-living. For reasons of comparison with other studies, we divided total household expenditure by household size to obtain per capita expenditure and did not use any equivalence scales, i.e. no adjustments were made for economies of scale and/or differences in need by age and sex (Deaton, 1994). Since household composition did not change significantly in Burkina Faso between 1994 and 2003, using per capita instead of adult equivalence estimates might introduce a significant bias in poverty levels, especially if compared across households with different household structure, but should not considerably affect estimates of aggregate poverty changes.
1.3.3 Survey Design

The INSD has continuously improved the design of the household surveys in Burkina Faso, which might however have lowered the comparability of poverty estimates over time. More precisely, the survey design of the EPI, the EPII, and the EPIII differ in three major points: First, whereas the EPI was undertaken in the post-harvest period (October to January), the EPII and the EPIII were undertaken in the pre-harvest period (May to August). Second, whereas the EPI had a recall period for food items of 30 days the EPII and the EPIII had a recall period for food items of only 15 days. Third, the disaggregation of expenditures was continuously increased from 1994 to 2003 from 50 items in 1994 to 70 items in 1998 and 80 items in 2003 (Table 1.2). Such changes in survey design can have a considerable impact on poverty and inequality estimates.

First, it is often argued that in developing countries real household consumption in the pre-harvest season is considerably lower than in the post-harvest season. For example Dercon and Krishan (2002), using panel data of 1,450 rural Ethiopian households, show that differences in real food consumption before and after the harvest amounted up to 10 percent for the poorest households. Since we can observe high seasonal price fluctuations for the case of Burkina Faso (see Figure 1.4), we can assume that households in Burkina Faso considerably reduce their real consumption during the pre-harvest season and increase their real consumption during the post-harvest season.

Whether this leads to an in- or decrease in nominal household consumption is unclear and depends on the induced price changes. Annual price changes are however also covered by the poverty lines in 1994, 1998, and 2003, which use the observed food and non-food prices of the respective survey period. Thus, whether a household lies below or above the poverty line only depends on changes in real consumption and not on changes in prices. Hence, the fact that EPI was conducted in the post-harvest season whereas EPII and EPIII was conducted in the pre-harvest season implies that poverty in 1994 has been underestimated relative to poverty in 1998 and 2003.

Second, empirical studies show that longer recall periods lead to considerably lower declared expenditures. For example, Scott and Amenuvegbe (1990) show that for frequently purchased items reported expenditures fell at an average of
2.9 percent for every day added in the Ghanaian LSMS. Deaton (2003a) reports an experiment with different recall periods in India where shortening the recall period for food items from 30 to 7 days resulted in a 30 percent higher food consumption. This implies that in Burkina Faso poverty in 1994, which had a recall period of 30 days for food expenditure (in contrast to 15 days for 1998 and 2003), was overestimated relative to poverty headcount estimates for 1998 and 2003.

Last, it has been shown, that a higher disaggregation of expenditure items leads to higher declared expenditures (Jolliffe, 2001; Lanjouw and Lanjouw, 2001). As the number of registered food and non-food items increased from 50 to 70 and to 80 items in 1994, 1998 and 2003, respectively, poverty in 1994 was underestimated relative to 1998 and 2003 and poverty in 1998 was still underestimated (although to a lesser extent) in comparison to 2003.

To achieve comparability of poverty estimates based on different household survey designs the literature suggests various methods, which, however, require rather strong assumptions and/or very detailed data. With regard to seasonality, given the fact that we do not have any panel data and that within each survey year

---

**Figure 1.4: Seasonal Price Variations**

![Seasonal Price Variations](image)


*Notes:* In each year, prices are indexed to an average of 100.
all households have been interviewed during the same period, there is no convincing method to accurately quantify the seasonal effect on expenditure declarations.

To redress the problem of a recall and/or disaggregation bias, it is sometimes suggested to only include those consumption items in the household expenditure aggregate which were unaffected by changes in the recall period and/or the disaggregation of consumption items (Deaton and Drèze, 2002; Tarozzi, 2004; Lanjouw and Lanjouw, 2001). However, the application of the above suggested method would have meant in both cases to exclude basic food items which account for a very large share of total Burkinabè household expenditure. Moreover, this method introduces a new bias if the budget share devoted to the ‘excluded’ consumption items changes over time, which is likely given the strong annual and seasonal price fluctuations of basic food items.

Last, whereas the proposed methods do certainly improve poverty estimates whenever only one of the above described changes in survey design is relevant, we think that given the various changes in survey design in Burkina Faso, any corrections would not only have tremendously decreased the transparency of the poverty estimates but would even have led to a further enhancement of measurement error.

We therefore decided to compute the expenditure aggregate - which will be presented in Section 1.4.1 - without any further corrections for survey design. But we will check the robustness of our poverty estimates in Sections 1.4.2. Another alternative would have been to exclude the household survey of 1994 and only use the surveys of 1998 and 2003, which have a much higher degree of comparability (Table 1.2). But we think all information available should be used to analyze not only short-term but also long-term growth and poverty dynamics in Burkina Faso.

1.4 Revised Growth-Poverty Assessments

1.4.1 Revised Poverty and Inequality Estimates

Using a time consistent expenditure aggregate and poverty line, but making no corrections for changes in household survey design, we provide a new poverty and inequality assessment for Burkina Faso in Table 1.4. According to these new estimates, national headcount poverty, or P0 of the FGT measures (Foster et al.,
1984), increased strongly between 1994 and 1998 from 55.5 to 61.8 percent but then decreased, also substantively, between 1998 and 2003 to 47.2 percent, i.e. to a lower level than in 1994. In rural areas, we find the same poverty dynamics, but on a higher level: from 63.4 in 1994 to 68.7 in 1998 to 53.3 percent in 2003. In urban areas, we show that poverty increased from 14.7 in 1994 to 27.3 in 1998 and then decreased to 20.3 percent in 2003. Therefore, and in contrast to rural areas, urban poverty in 2003 was still substantially higher than in 1994, indicating an 'urbanization of poverty' (see also Haddad et al., 1999). But throughout all three survey years poverty in urban areas remained significantly lower than in rural areas.

Table 1.4: Poverty and Inequality Trends - Revised Estimates

<table>
<thead>
<tr>
<th></th>
<th>Urban</th>
<th>Rural</th>
<th>National</th>
</tr>
</thead>
<tbody>
<tr>
<td>P0</td>
<td>14.7</td>
<td>27.3</td>
<td>20.3</td>
</tr>
<tr>
<td>P1</td>
<td>3.9</td>
<td>8.3</td>
<td>5.7</td>
</tr>
<tr>
<td>P2</td>
<td>1.5</td>
<td>3.5</td>
<td>2.3</td>
</tr>
<tr>
<td>Gini</td>
<td>0.45</td>
<td>0.50</td>
<td>0.48</td>
</tr>
<tr>
<td>PL</td>
<td>53,219(100)</td>
<td>82,885(155.7)</td>
<td>82,672(155.3)</td>
</tr>
<tr>
<td>CFa F (Index 1994=100)</td>
<td>1994</td>
<td>1998</td>
<td>2003</td>
</tr>
</tbody>
</table>

Source: EPI, EPII, EPIII. Computations by the authors.

Notes: P0: poverty headcount. Gini: measure of inequality. The revised national poverty lines (PL) are calculated by the authors and expressed on a yearly per capita basis in current CFA F. The Gini coefficient is population weighted.

Between 1994 and 1998, inequality as measured by the Gini coefficient increased from 0.45 to 0.50 in urban areas, but decreased from 0.39 to 0.35 in rural areas and from 0.47 to 0.45 on a national level. Thereafter between 1998 and 2003, inequality stagnated in urban areas, increased again to 0.39 in rural areas, but remained constant on a national level, indicating a compensation of higher within group inequality by lower between group (urban/rural) inequality.

Obviously, this new assessment sheds a totally different light on poverty dynamics in Burkina Faso during the last ten years (see Tables 1.1 and 1.4). Whereas official estimates showed - more or less - stagnant national poverty rates, the re-
1.4. Revised Growth-Poverty Assessments

Revised poverty rates indicate rising poverty between 1994 and 1998 and falling poverty thereafter, with poverty in 2003 being below poverty in 1994. An interesting question is which of the biases described and corrected had the largest impact on the difference between original and revised estimates. Table 1.5 therefore provides the quantitative impact of the various adjustments made.

### Table 1.5: Decomposition of the Bias in Official Poverty Estimates

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PO (official estimates)</td>
<td>44.5</td>
<td>45.3</td>
<td>46.4</td>
</tr>
<tr>
<td>Consistent Welfare Aggregates</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypothetical Rents</td>
<td>41.2</td>
<td>(45.3)</td>
<td>(46.4)</td>
</tr>
<tr>
<td>Exclusion of Durables</td>
<td>(41.2)</td>
<td>45.8</td>
<td>47.2</td>
</tr>
<tr>
<td>No Adjustment to NA</td>
<td>(41.2)</td>
<td>53.6</td>
<td>(47.2)</td>
</tr>
<tr>
<td>Consistent Poverty Lines</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant Consumption Basket</td>
<td>55.5</td>
<td>61.8</td>
<td>(47.2)</td>
</tr>
<tr>
<td>PO (revised estimates)</td>
<td>55.5</td>
<td>61.8</td>
<td>47.2</td>
</tr>
<tr>
<td>Consistent Survey Design</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Survey period pre-harvest</td>
<td>increase</td>
<td>61.8</td>
<td>47.2</td>
</tr>
<tr>
<td>Recall period 15 days</td>
<td>decrease</td>
<td>61.8</td>
<td>47.2</td>
</tr>
<tr>
<td>80 expenditure items</td>
<td>decrease</td>
<td>61.8</td>
<td>47.2</td>
</tr>
</tbody>
</table>

Source: EPI, EPII, EPIII. Computations by the authors.

Notes: Parentheses indicate that no change occurs with respect to the previous estimate. The decomposition would slightly differ if the poverty line was changed before the re-computation of the expenditure aggregate.

It can be seen that the consistent inclusion of hypothetical rents considerably reduces poverty in 1994. The complete exclusion of durables has only a minor impact, but somewhat increases poverty in 1998 and 2003. As one can expect, omitting the 'correction factor' of 1.124 in 1998 substantially increases poverty in 1998, namely by 7.8 percentage points. In other words, the computation of a consistent expenditure aggregate already leads to a considerable increase in poverty between 1994 and 1998 and to a decrease between 1998 and 2003. But poverty in 2003 would still be higher than poverty in 1994. Only the use of a time-consistent poverty line leads to a poverty reduction between 1994 and 2003.
As described in Section 1.3.3, we did not correct for changes in survey design between 1994 and 1998/2003 because an exact quantification of the bias linked to survey design doesn’t seem to be possible. Hence, in Table (1.5) we only indicate if corrections for biases in survey design would in- or decrease our poverty estimates in 1994 and provide a robustness check of our revised poverty trends in next section.

1.4.2 Robustness Check

To assess the robustness of our results, we first provide a rough monetary quantification of the biases induced by changes in survey design between 1994 and 1998/2003. Second, we confront our estimated poverty trends with a dynamic wellbeing assessment based on several non-monetary indicators.

With regard to seasonality, if we rely on a study by Reardon and Matlon (1989) who have shown for the case of poor households in Burkina Faso that consumption varies by about 13 percent across seasons, we may assume that real expenditures in the pre-harvest season in 1998/2003 were on average not more than 13 to 15 percent underestimated in comparison to 1994.

With regard to the longer recall period in 1994, if we take a study of Deaton (2003a) who has shown an increase of 30 percent declared expenditure for a decrease in the recall period from 30 to 7 days, we estimate that the recall bias might be responsible for about 11 percent higher declared consumption in 1998/2003 compared to 1994. More precisely, if a decrease in the recall period from 30 to 7 days leads to 30 percent higher declared expenditure, a decrease from 30 to 15 days should not lead to a higher than 15 percent increase in declared expenditure. As only food expenditures, which account for not more than 70 percent of households’ expenditure in Burkina Faso, were affected by the change in recall period, we calculate 0.7 times 0.15 which is equal to about 11 percent.

Last, we address the bias that might be induced by a higher disaggregation of expenditure items between 1994 and 2003. A study by Lanjouw and Lanjouw (2001) indicates an increase of declared expenditure of 0.05 percent for every ‘per-

\textsuperscript{13}We can assume that the bias is less severe for longer recall periods.
cent' consumption item added. Applying these estimates to the case of Burkina Faso, suggests that consumption in 1998 and 2003 was overestimated by about 2 (1998) and 3 (2003) percent, respectively (in comparison to 1994).

Notice that the above biases in survey design offset each other to a large extent. More precisely, whereas the pre-/post-harvest bias underestimates consumption in 1998/2003 by about 13 to 15 percent, the bias in the recall period overestimates consumption in 1998/2003 by 11 percent and the number of declared consumption items overestimates consumption in 1998/2003 by 2 to 3 percent, in comparison to 1994. This implies that our poverty estimates should be quite accurate with regard to poverty trends.

Moreover, only if consumption increased across all households by more than 12 percent in 1998, the poverty headcount in 1998 would be lower than the poverty headcount estimated for 1994. Conversely, only if consumption decreased across all households by more than 17 percent in 2003, the poverty headcount in 2003 would be higher than the poverty headcount estimated for 1994. In other words, the pre-/post-harvest bias would have to off-set the two later biases by more than 12 percent in consumption to obtain a poverty headcount for 1994 which is higher than the one estimated for 1998. Conversely, the latter two biases would have to offset the pre-/post-harvest bias by more than 17 percent in consumption to offset the stated poverty reduction between 1994 and 2003.

Both scenarios are very unlikely given the approximated biases induced by changes in survey design. Therefore, the finding that poverty increased between 1994 and 1998 and decreased between 1994 and 2003 (and hence also between 1998 and 2003) seems quite robust against these three sources of bias in survey design.

Next, we compare our monetary estimates with various non-monetary indicators of wellbeing. As shown in Table 1.6 our revised assessment of monetary poverty is also in line with the development of various social indicators. These measures were computed with the same household surveys, but were not subject to potential seasonal, recall, or disaggregation biases in survey design, nor were they affected by an 'arbitrary' poverty line - or difficulties in adjusting poverty

---

14This is an average estimate for the poorest 50 percent of the population. Lanjouw and Lanjouw (2001) show that the bias induced by a disaggregation of expenditure items rather decreases for households at the upper end of the expenditure distribution.
Table 1.6: Non-Monetary Indicators of Wellbeing

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiteracy rate</td>
<td>51.1</td>
<td>51.2</td>
<td>46.1</td>
<td>89.4</td>
<td>89.1</td>
<td>89.1</td>
<td>82.7</td>
<td>81.8</td>
<td>79.6</td>
</tr>
<tr>
<td>Enrolled 6 to 18</td>
<td>62.2</td>
<td>60.2</td>
<td>64.3</td>
<td>21.9</td>
<td>16.5</td>
<td>19.9</td>
<td>28.0</td>
<td>23.4</td>
<td>27.5</td>
</tr>
<tr>
<td>Health</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Handicap</td>
<td>4.8</td>
<td>5.9</td>
<td>2.4</td>
<td>5.1</td>
<td>5.7</td>
<td>2.7</td>
<td>5.1</td>
<td>5.9</td>
<td>2.9</td>
</tr>
<tr>
<td>Med. Consult</td>
<td>45.9</td>
<td>50.9</td>
<td>71.2</td>
<td>37.1</td>
<td>42.0</td>
<td>60.7</td>
<td>39.5</td>
<td>44.2</td>
<td>63.0</td>
</tr>
<tr>
<td>Housing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electricity</td>
<td>29.7</td>
<td>35.7</td>
<td>45.6</td>
<td>0.7</td>
<td>0.4</td>
<td>1.0</td>
<td>5.4</td>
<td>6.3</td>
<td>9.3</td>
</tr>
<tr>
<td>Water</td>
<td>23.5</td>
<td>24.0</td>
<td>27.1</td>
<td>0.3</td>
<td>0.1</td>
<td>0.2</td>
<td>4.1</td>
<td>4.2</td>
<td>5.2</td>
</tr>
<tr>
<td>Sanitation</td>
<td>88.8</td>
<td>84.8</td>
<td>90.8</td>
<td>18.1</td>
<td>14.6</td>
<td>21.3</td>
<td>29.5</td>
<td>26.3</td>
<td>34.2</td>
</tr>
</tbody>
</table>

Source: EPI, EPII, EPIII. Computations by the authors.

Notes: Illiteracy rate: Share of illiterate individuals older than 18 years. Enrolled 6 to 18: Share of children 6 to 18 years old enrolled in school. Handicap: Share of individuals living in a household where the household head suffers from a handicap. Med. Consult: Share of ill persons having consulted medical services. Electricity, Water, Sanitation: Share of individuals living in a household with access to modern energy, water, and sanitation facilities.

lines over time. Notice that non-monetary indicators usually provide a more long-term trend in changes in poverty as they are much more stable over time and are less prone to annual wellbeing fluctuations. Moreover, improvements in non-monetary welfare indicators are - at least in the short and medium term - infrequently reversed in case of economic downturns.

Enrollment rates in urban as well as in rural areas decreased between 1994 and 1998 and increased between 1998 and 2003. The share of persons living in a household where the household head suffers from a serious physical handicap increased between 1994 and 1998 and decreased afterwards. Whereas living conditions, for example electricity connection or a comfortable access to (proper) water or toilet facilities, did not improve much between 1994 and 1998 or even deteriorated,\textsuperscript{15} they improved substantially between 1998 and 2003. All non-monetary

\textsuperscript{15}One might question whether housing is at all able to deteriorate, i.e. if a household already connected to modern electricity, water and sanitation facilities can be disconnected over time. However, whether a household uses modern electricity, water and sanitation facilities does not only depend on the access to the infrastructure but also on the ability to pay for user fees and
indicators, except, interestingly, school enrollment in rural areas, show also improvements between 1994 and 2003.

These results support our estimated monetary poverty dynamics of increasing poverty between 1994 and 1998 and decreasing poverty thereafter, as well as an overall poverty reduction between 1994 and 2003. It might be worthwhile to mention that non-monetary indicators are certainly not a perfect indicator of changes in money-metric poverty of individual households (e.g. Klasen, 2000). However, in the long run and on an aggregate (i.e. national) level the correlation between these two dimensions of poverty is in general quite high (e.g. Kanbur and Squire, 2001). We analyzed a rather short period of 9 years and hence the previous statement does not fully apply. But we can at least state that social indicators showed the same trends as our monetary poverty estimates between 1994 and 2003.

1.4.3 Growth Elasticities of Poverty

Based on our revised estimates we analyze in more detail the link between macro-economic growth and micro-economic poverty reduction, calculating growth elasticities of poverty for selected monetary and non-monetary welfare indicators. The growth elasticity of poverty simply calculates the relative change in poverty given a one percent increase in GDP per capita between \( t \) and \( t - 1 \). For the case of the headcount poverty \( P_0 \) this implies:

\[
\varepsilon_t = \frac{\Delta P_{0,t-1}/P_{0,t-1}}{\Delta GDP_{t-1}/GDP_{t-1}}
\]

(1.1)

where \( P_0 \), the headcount poverty, can refer to any monetary or non-monetary indicator. It has been argued that for policy purposes the impact of growth in GDP per capita on absolute changes in poverty (and not relative changes in poverty) maintenance, which may indeed decrease over time. Moreover, Burkina Faso faced very high population growth rates, with an average of 2.4 percent per year in the last decade. If hence no improvements in infrastructure take place, high population growth can easily lead to a decrease of infrastructure access per capita. Last, migration is a widespread phenomenon in Burkina Faso and it is thus also likely that families move to poorer housing (with less infrastructure) if their economic situation worsens.

The decrease in rural enrollment rates is obviously also reflected in national enrollment rates.

Additional measures to assess the impact of growth on poverty, or in other words to assess the 'pro-poorness' of growth, are presented in Essay 2.
might be more relevant (Klasen and Misselhorn, 2006). Hence, alternatively we compute the growth semi-elasticity of poverty given by:

$$\varepsilon_t = \frac{\Delta P_{0t,t-1}}{\Delta GDP_{t,t-1}/GDP_{t-1}}$$

(1.2)

Instead of analyzing the impact of GDP growth per capita on poverty changes, one might think of using the Gross National Income (GNI) per capita instead. As income flows in- and out of the country are rather low for Burkina Faso, the difference between the two is, however, quite small: between 1994 and 2003 the growth rate of GDP per capita was 2.30 percent, whereas the growth rate of GNI per capita amounted to 2.34 percent (World Bank, 2005). Alternatively, also the mean income as measured in the household surveys could be applied as a denominator in equation (1.1) and (1.2). But as all three Burkinabè household surveys, EPI, EPII, and EPIII, only contain reliable information on households’ consumption and not on income, calculated growth elasticities of poverty would more or less only yield the distributional change in consumption of households. Thus we only report GDP growth elasticities of poverty.

For the case of Burkina Faso, as one can expect from the previous section, the monetary growth elasticity of poverty, was positive between 1994 and 1998 and negative between 1998 and 2003 and between 1994 and 2003. More precisely, between 1994 and 1998 a one percent growth of GDP per capita on the national level was accompanied by a 0.9 percent increase in the poverty headcount index. In contrast, between 1998 and 2003 the respective elasticity was -2.9, showing that during that later period macro-economic growth led to strong poverty reduction. In total, this lead to an overall weak growth elasticity of poverty of -0.8 over the whole period 1994-2003 (Table 1.7).

In rural areas, the elasticities were in all periods very close to the national ones, namely 0.7 for 1994-1998, -2.7 for 1998-2003, and -0.9 for 1994-2003.

---

18 As in most developing countries, with a large rural population mainly living from subsistence farming, expenditures rather than income is the better measure of households’ monetary well-being (see e.g. Deaton, 1997 for discussion), LSMS household surveys usually focus on a precise data collection of expenditures rather than of income.

19 One should rather state that the national elasticities were very close to the rural elasticities as national elasticities are driven by rural elasticities with about 80 percent of the Burkinabè population living in rural areas (Günther and Grimm, 2004).
### Table 1.7: Selected Growth Elasticities of Poverty

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Urban</td>
<td>Rural</td>
<td>National</td>
<td>Urban</td>
<td>Rural</td>
<td>National</td>
<td>Urban</td>
<td>Rural</td>
<td>National</td>
</tr>
<tr>
<td>Growth Elasticities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expenditure</td>
<td>6.8</td>
<td>0.7</td>
<td>0.9</td>
<td>-3.2</td>
<td>-2.7</td>
<td>-2.9</td>
<td>1.6</td>
<td>-0.9</td>
<td>-0.8</td>
</tr>
<tr>
<td>Health</td>
<td>1.8</td>
<td>1.2</td>
<td>1.2</td>
<td>-5.2</td>
<td>-14.6</td>
<td>-6.3</td>
<td>-1.6</td>
<td>-2.5</td>
<td>-2.3</td>
</tr>
<tr>
<td>Education</td>
<td>0.4</td>
<td>0.5</td>
<td>0.5</td>
<td>-1.3</td>
<td>-0.5</td>
<td>-0.7</td>
<td>-0.3</td>
<td>0.1</td>
<td>0.0</td>
</tr>
<tr>
<td>Water</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>-0.5</td>
<td>0.0</td>
<td>-0.1</td>
<td>-0.3</td>
<td>0.0</td>
<td>-0.1</td>
</tr>
<tr>
<td>Sanitation</td>
<td>2.8</td>
<td>0.3</td>
<td>0.4</td>
<td>-4.9</td>
<td>-1.1</td>
<td>-1.3</td>
<td>-1.0</td>
<td>-0.2</td>
<td>-0.4</td>
</tr>
<tr>
<td>Growth Semi-Elasticities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expenditure</td>
<td>1.0</td>
<td>0.4</td>
<td>0.5</td>
<td>-0.9</td>
<td>-1.2</td>
<td>-1.8</td>
<td>0.3</td>
<td>-0.5</td>
<td>-0.4</td>
</tr>
<tr>
<td>Health</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>-0.3</td>
<td>-0.4</td>
<td>-0.4</td>
<td>-0.1</td>
<td>-0.1</td>
<td>-0.1</td>
</tr>
<tr>
<td>Education</td>
<td>0.2</td>
<td>0.4</td>
<td>0.4</td>
<td>-0.5</td>
<td>-0.4</td>
<td>-0.5</td>
<td>-0.1</td>
<td>0.1</td>
<td>0.0</td>
</tr>
<tr>
<td>Water</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>-0.3</td>
<td>0.0</td>
<td>-0.1</td>
<td>-0.2</td>
<td>0.0</td>
<td>-0.1</td>
</tr>
<tr>
<td>Sanitation</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
<td>-0.7</td>
<td>-0.8</td>
<td>-1.0</td>
<td>-0.1</td>
<td>-0.2</td>
<td>-0.3</td>
</tr>
</tbody>
</table>

**Source:** Poverty Estimates: EPI, EPII, and EPIII. Computations by the authors. GDP per capita growth rates: IAP.

**Notes:** Expenditure: Change in share of individuals living below the poverty line specified in Section 1.4.1. Education: Change in share of individuals aged 6-18 not enrolled in school. Health: change in share of individuals living in a household where the household head suffers from a severe handicap. Water and Sanitation: Share of individuals living in a household with poor water or sanitation facilities.

In urban areas, the respective elasticities were 6.8 (1994-1998), -3.2 (1998-2003), and 1.6 (1998-2003). Hence, urban elasticities were usually higher in magnitude than rural and national elasticities, and growth led - again in contrast to the rural and national level - to a poverty increase over the whole observation period.

Comparing these growth elasticities of poverty with non-monetary elasticities, it is first of all interesting to see that non-monetary elasticities are most of the time - but not always - positively correlated with monetary growth elasticities of poverty (Table 1.7). Furthermore, the extent as well as the variation over time of elasticities is much lower for non-monetary than for monetary indicators. This seem to indicate both that there is some inertia in non-monetary welfare changes - whether this is positive or negative from a normative perspective is not clear - and that the correlation between macro-economic growth and non-monetary poverty is in general lower than between growth and monetary poverty.

Last, the comparison with growth semi-elasticities shows that when comparing elasticities across space and across indicators, semi-elasticities seem to be
more relevant than elasticities (Table 1.7). As elasticities are largely driven by the initial poverty level, with lower poverty levels leading to higher growth elasticities (Klasen and Misselhorn, 2006), the impact of growth on poverty seems to be overestimated for areas and indicators with low poverty levels. Using semi-elasticities instead of elasticities leads to much more similar results across space (urban, rural, national) and welfare indicators (expenditure, health, education, and housing). Obviously, the differences across time remain whether we use elasticities or semi-elasticities.

1.5 Conclusion

1.5.1 The ‘Arithmetic’ Paradox

Previous poverty assessments for Burkina Faso neglected some important methodological inconsistencies with regard to the measurement of poverty dynamics and led to the so-called ‘Burkinabè Growth-Poverty-Paradox’ between 1994 and 2003, i.e. relatively sustained macro-economic growth, but stagnating poverty rates despite constant inequality estimates. Addressing these methodological inconsistencies (see Section 1.3) by calculating a time consistent welfare aggregate and welfare cutoff, we show that poverty actually decreased between 1994 and 2003. Hence, and in contrast to previous studies, we state that growth was actually pro-poor, i.e. growth of GDP per capita led to poverty reduction, with a growth elasticity of poverty close to -1.

Several methodological conclusions can be drawn from these revised results. First, this analysis has clearly shown that poverty rates might be considerably driven by the methodology used to compute the poverty line and welfare aggregate as well as by survey design, which can significantly lower the comparability of poverty estimates across time. Burkina Faso is certainly no exception here and methodological differences or inconsistencies might explain a considerable part of the observed heterogeneity of growth elasticities of poverty across countries.

This also implies that a continuous quality improvement of household surveys, which is done in many developing countries, might lead to better static poverty estimates but might lead to considerable biases in estimated poverty trends. Hence,
there might be some trade-off between estimating state-of-the-art poverty ‘snap-shots’ or poverty ‘dynamics’.

Moreover, the scientific debate on robust poverty estimates over time often focuses on the impact of the initial location of poverty lines on calculated poverty dynamics (see e.g. Davidson and Duclos, 2000). However, as already argued by Lanjouw (1998) the vigorous attention paid to a ‘precise’ location of a poverty line might be misplaced. Poverty lines will always retain an element of arbitrariness. Instead, it might be worthwhile to pay more attention to a ‘precise’ inflation of poverty lines.

Last, we have shown, that growth elasticities of non-monetary poverty can help to ‘verify’ money-metric growth elasticities of poverty. Non-monetary indicators are less prone to time-inconsistent surveys, data, and poverty lines, and are hence more comparable over time as well as across countries. These indicators have however rarely been used in the literature on cross-sectional growth elasticities of poverty. Calculating non-monetary growth elasticities of poverty might also be interesting for projections in the context of the Millennium Development Goals (MDGs). Observed monetary growth elasticities of poverty have often been used to forecast the progress towards MDG One (for an overview see Rami, 2006). No such analysis has yet been done for the other seven MDGs which are based on non-monetary welfare indicators.

1.5.2 The ‘Economic’ Paradox

We redress the ‘Burkinabè paradox’ between 1994 and 2003 and show that growth indeed led to poverty reduction. However, we now show that poverty even increased despite macro-economic growth between 1994 and 1998, and in urban areas also between 1994 and 2003. Whereas we redress the ‘paradox’ between 1994 and 2003 from an arithmetic perspective, we can explain the remaining ‘paradox’ between 1994 and 1998 (and between 1994 and 2003 in urban areas) from an eco-

---

20 One exception is e.g. a study of Grosse et al. (2006), which uses non-monetary indicators for a pro-poor growth assessment of Bolivia based on the growth incidence curve (see also Essay 2).

21 MDG One: Eradicate extreme hunger and poverty. Target One: Reduce by half the proportion of people living on less than a dollar a day.
nomic perspective: by addressing variations in the purchasing power of the poor relative to the non-poor.\textsuperscript{22}

The poverty up-swing between 1994 and 1998 can be explained by a considerable increase in food prices after one of the severest Burkinabè droughts in 1997/98, primarily increasing the cost-of-living of the poor.\textsuperscript{23} This led to the massive inflation of the poverty line relative to the CPI between 1994 and 1998 (Figure 1.3 and Table 1.4). The reason why growth did not even lead to poverty reduction between 1994 and 2003 in urban areas can again be explained by changes in the purchasing power of the urban (poorer) population. The devaluation of the CFA-Franc in 1994, which on the one hand led to gains in competitiveness of Burkinabè enterprises, led on the other hand to a significant decrease in the purchasing power of the employed urban population, as wages were not indexed to inflation after the devaluation (for details see Grimm and Günther, 2004).

These results nicely demonstrate that the general trend in Burkina Faso of macro-economic growth leading to poverty reduction has been interrupted twice by economic shocks which had a considerable impact on poverty. From 1994 onwards the urban poor population was severely affected by the devaluation of the CFA-Franc and in 1998 one of the most devastating Burkinabè droughts had a massive impact on rural poverty rates. Hence, the impact of (reoccurring) shocks (and not only policies) on the heterogeneity of growth elasticities of poverty should receive further attention.\textsuperscript{24}

Last, the estimated different growth elasticities of poverty across time and space also clearly illustrate that long-term trends on the national level might cover huge spatial and temporal disparities. Thus, as the relationship between growth and poverty can enormously vary over time and space, average growth elasticities of poverty can be quite misleading even for a single country let alone for all countries (see e.g. Ravallion and Chen, 1997; Ram, 2006).

\textsuperscript{22}A more detailed analysis of the impact of changes in relative purchasing power on pro-poor growth (assessments) is provided in Essay 2.

\textsuperscript{23}Due to the fact, that on an annual basis more than 70 percent of farmers in rural areas are net buyers and not net sellers of food crops, even most of the households engaged in food crop production could not benefit from the price increase after the drought.

\textsuperscript{24}See also Essay 3 for a detailed discussion on the impacts of shocks on poverty dynamics.