Introduction and Overview

Believe those who are seeking the truth. Doubt those who find it.
Andre Gide, 1869 - 1951

The Concept and Measurement of Poverty

Not many development economists would contradict the statement that understanding and reducing poverty lies at the heart of development economics and also public attention on the ‘end of poverty’ (Sachs, 2005) has sharply increased within the last decade. The question is however, which poverty to understand, reduce and end? But despite 50 years of intensive research as well as political debate, the concept of poverty is still evolving with an ever increasing number of definitions and measures of poverty. Although all definitions contain the notion of individuals living in some ‘intolerable conditions’, the question of relevant conditions and the ambiguity of the term intolerable led to quite different concepts.

It might be argued, that an emphasis on poverty definitions is anyhow misplaced and research should rather concentrate on the causes of poverty. However, different definitions of poverty might not only change our assessment of worldwide poverty but also our strategies to ‘end’ poverty. Hence, a fuzzy concept of poverty is not helpful and one should be clear, which poverty is to be analyzed and reduced.

There will never evolve any ‘best’ or ‘right’ poverty measure which can be agreed on, because poverty is in the end a normative issue and different concepts will always measure different aspects of poverty rather than provide a comprehensive ‘right’ assessment of poverty. The debate on poverty concepts and measurement should hence be seen as a framework to think about the different aspects
of poverty rather than seeking for an ultimate measure of poverty. This framework on poverty thinking can, in principle, be summarized along four major lines, which are briefly discussed - without having the objective to be comprehensive - in the following:

**Poverty Dimensions**

The first issue concerns the question of an appropriate measure for the living standards of the poor. Is a *money-metric* indicator, such as income, an appropriate and sufficient measure or do we have to consider (several) additional dimensions of *human* wellbeing.

Building on Amartya Sen’s theoretical work (1985; 1999) on ‘capabilities and functionings’, proponents of multidimensional poverty concepts argue that income is but one of many means to increase human wellbeing. Income should hence be seen as an input to an individual’s standard of living rather than a direct measure of it, which should rather be conceptualized and measured with direct wellbeing outcomes, such as being safe, healthy, educated, well-sheltered, employed, etc. (see e.g. Klasen, 2000).

Today, there seems to be a wide consensus both among researchers and politicians that poverty is a multidimensional phenomenon, and, that poverty can only insufficiently be approximated by money-metric measures, even if income and other dimensions of wellbeing are often highly correlated (Kanbur and Squire, 2001). This is most prominently reflected in international measures of poverty, e.g. in the Human Development Index (HDI) as well as in the Millennium Development Goals (MDGs) - both analyzing multidimensional poverty -, but also in comprehensive survey data on the various dimensions of poverty, either col-

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1 Amartya Sen emphasizes that income is only valuable in so far it increases the ‘capabilities’ of individuals and thereby permitted ‘functionings’ in society.

2 The Human Development Index (HDI) has the objective to measure people’s wellbeing going beyond an income indicator. It is a weighted composite indicator of GDP per capita, life expectancy, school enrollment and literacy rates (UNDP, 2005). It was developed by the United Nations Development Program (UNDP) in 1990 and applied worldwide every year since then.

3 In 2000 the world’s nations as well as all major development institutions agreed on eight Millennium Development Goals - which comprise various dimensions of people’s wellbeing - to be achieved by 2015 (United Nations, 2005).
lected in general living standard measurement surveys (LSMS) or in specifically
designed demographic and health surveys (DHS).

**Poverty Perspectives**

The second question deals with the perspective to be taken when assessing the
wellbeing of individuals. This refers on the one hand to the question, whether poverty should be defined as *absolute* or *relative* deprivation, and on the other hand to the question, whether an *objective* or *subjective* perspective is appropriate.

Although often Townsend (1971) is cited for first discussing relative deprivation, poverty has indeed been analyzed both from an absolute and a relative perspective since the very early economic literature. Already Smith (1776) described the ‘necessaries’ of life as a relative deprivation of society and not only as a failure to meet a minimum subsistence level.4

Today, the international community often takes an absolute perspective for developing countries - where poverty lines are based on a minimum calorie intake - and a relative perspective for developed countries - where poverty lines are defined as a percentage of the mean or median income of a given population. For example, the World Bank currently applies a one US$ PPP per capita per day poverty line to developing countries whereas the European Union defines the poor as people with an income below a poverty line of 60 percent of the median income in the country in which they live.5

In contrast, the discussion and measurement of subjective poverty versus ‘objective’ measures of poverty is rather new. From a subjective perspective, anyone can be absolutely and/or relatively poor, depending on the individual’s own interpretation of his or her situation. This debate does not only refer to a subjective

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4*By necessaries I understand not only the commodities which are indispensably necessary for the support of life, but what ever the customs of the country renders it indecent ... to be without. A linen shirt, for example, is, strictly speaking, not a necessary of life ... But in the present times, through the greater part of Europe, a creditable day-laborer would be ashamed to appear in public without a linen shirt ... Custom, in the same manner, has rendered leather shoes a necessary of life in England’ (Smith, 1776).

5In 1985 the European Commission stated that those ‘persons whose resources are so limited as to exclude them from the minimum acceptable way of life in the member state in which they live’ (ECC, 1985) are considered to be poor.
‘cut-off’ below which an individual is considered to be poor, but also to a subjective relevant indicator of wellbeing to be analyzed. Note that this strand of research has mostly been applied in a national rather than in an individual context, i.e. not individual-specific but rather cultural-specific subjective poverty definitions have been revealed. As the understanding of poverty might widely differ across nations - it is argued - subjective wellbeing should be more relevant than a predefined objective but ‘arbitrary’ indicator and ‘cut-off line’ for poverty.

Recently, there is an increasing number of qualitative studies which try to reveal subjective understandings of poverty. Most well-known here is probably the research around the World Value Survey (WVS) or the ‘Voices of the Poor’ study by Narayan et al. (2000). Moreover, a ‘subjective’ question to derive an ‘objective’ national poverty line subjectively is now often included in standard living standard measurement surveys (LSMS).}

**Poverty Severity**

Besides the identification of a relevant welfare indicator (the poverty dimension) and cut-off below which we consider individuals as poor (the poverty perspective), we should also be concerned with the scale of poverty (the poverty severity). The easiest measure of the magnitude of poverty - and also by far the most often applied in empirical analysis - is the poverty headcount, simply counting the number of people which fall below a certain cut-off (poverty line) in a certain poverty dimension.

Obviously such an index is a very rough indicator of the severity of poverty and has several undesirable axiomatic properties (for a discussion see e.g. Sen, 1976). Since the very early literature on the measurement of poverty several measures have therefore been developed, which also take into account the severity of poverty. This means they go beyond a dichotomous measure of poverty, simply dividing the population into the poor and non-poor, making a difference between the magnitude of poverty among the poor (e.g. Foster et al., 1984; Sen, 1976; Watts, 1968). Despite these long-standing advances, the poverty headcount is still

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6Basically, the question is: ‘How much income would you need to consider yourself as well-off?’
widely used; probably because it has - in contrast to many other measures - a quite intuitive interpretation and is therefore more attractive to policy makers.

The previous three classifications of poverty measures have long been discussed, mostly separately but also the ‘whole’ framework has been covered. For example Sen (1976; 1983; 1992) refers to poverty dimensions, perspectives, and severity as poverty space, identification, and aggregation. In contrast, the last aspect of poverty, which will be discussed in the following, namely ‘time’, has until recently somewhat been neglected in the discourse on the definition of poverty.

**Poverty Dynamics**

Time in poverty analysis can refer to both static *snap-shot* versus *dynamic* poverty measures as well as to *ex-post* (or actual) versus *ex-ante* (or potential) poverty analysis. There is a long history of thinking about poverty over time on the macro-level both from a theoretical perspective, i.e. why some nations might be trapped into poverty while others escape (e.g. Smith, 1776), as well as from an empirical perspective, i.e. measuring changes in national or international wellbeing over time (see e.g. the World Development Report).

To the contrary, the study of micro-level poverty dynamics, i.e. individuals moving in and out of poverty, i.e. the study of chronic versus transient poverty, had been largely neglected until the 1990s - also due to data limitations, more precisely because of a lack of panel data. However, time or duration certainly is an important dimension for the understanding of individuals’ current as well as lifetime well-being (Baulch and Hoddinott, 2000). In addition, ‘time’ allows for a distinction between structural and stochastic poverty as well as for an incorporation of the notion of risk in wellbeing analysis. This should certainly be of relevance if we assume that individuals are risk-averse.

Moreover, the concept of poverty dynamics has moved from an ex-post to an ex-ante analysis of poverty dynamics, acknowledging that individuals’ current (or past) wellbeing might not be a good indicator of their poverty risk - or in other words their vulnerability to poverty (Calvo and Dercon, 2005) - which might not only have an impact on individuals’ future but also on their current wellbeing. This literature is, however, still in its infancy both from a conceptual as well as from a methodological perspective.
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Last, closely related to poverty dynamics is an analysis of the causes of poverty: With static measures, i.e. without a time dimensions, one cannot go beyond an analysis of the correlates of poverty. Analysis of poverty dynamics - both from a macro- as well as from a micro-perspective - is hence important to understand the causes of poverty, and not only the correlates of poverty, which has so far dominated the empirical literature.

The Empirical Analysis of Poverty Dynamics

The scientific discourse on poverty measurement has (or at least should have) the objective to analyze ‘real-world’ poverty, as poverty reduction does not only lie at the heart of development economics but also at the ‘heart’ of many people both in developing as well as in developed countries. Hence, and as already briefly discussed, the conceptual debate on poverty is carried over to empirical analysis.

The empirical analysis of poverty has greatly been simplified in the last decade by a tremendous increase of available micro-level data\(^7\) as well as by a rapid technological progress in information technologies to store and analyze these data sets (Bardhan, 2005). However, the empirical application of several poverty concepts - and this is until now especially true for the analysis of poverty dynamics, which is a rather recent studied dimension of poverty - is still constrained by data limitations as well as by an overall lack of data.

In the analysis of poverty dynamics, limited data has often been assumed away, which might have led to biased assessments of poverty dynamics in the past (see Essay 1 and Essay 2). Moreover, missing data has often led to data driven concepts, rather than to new surveys being based on relevant poverty concepts. This has - at least in the past - led to a neglect of certain aspects of poverty dynamics (see Essay 3 and Essay 4).

Thus the four essays in this thesis deal with different aspects of the Empirical Analysis of Poverty Dynamics, explicitly taking into account present data limitations. Certainly, more comprehensive data to measure poverty over time would be ideal. The question is, if the ‘time’ dimension of poverty should be ignored until the data requirements for the analysis of poverty dynamics are met. Or, if

\(^7\)For example the living standard measurement surveys (LSMS) of the World Bank which are now available for most developing countries.
it might be useful to think about alternative methods for the empirical analysis of poverty dynamics - using currently available data sets - until the dimension of time is appropriately - also with the help of such work - incorporated into micro-level surveys.

**Macro Poverty Dynamics and Limited Data**

Essay 1 and Essay 2, which are both based on joint work with Michael Grimm, discuss difficulties related to limited data in the analysis of aggregate poverty dynamics.\(^8\) Even if there has been a long interest in national poverty dynamics, many surveys are still designed to give the most ‘appropriate’ static picture of poverty rather than ‘accurate’ estimates of national poverty dynamics. Or in other words, even if only (several) cross-sectional surveys are needed to analyze aggregate poverty dynamics, these cross-sectional data sets still have to be comparable over time, which is often not the case.

It has been argued that many estimates of poverty dynamics are biased by measurement errors induced by changing survey design or data collection, which might considerably reduce a clear monitoring of poverty over time. Moreover, with the increase of conditional development aid, some ‘measurement error’ might also be induced by political considerations to ‘negotiate’ numbers, i.e. to change methodologies over time, following Orwell’s (1949) Ministry of Truth: ‘who controls the past (figures), controls the future (aid flow)’.\(^9\)

But although the problems - at least related to data collection and methodology - have theoretically widely been discussed (Deaton, 1997), they are often ignored in the empirical analysis of poverty dynamics. Moreover, poverty estimates, once published, are often assumed to reflect ‘true’ poverty changes, without questioning the underlying data or method anymore. Thus survey and data inconsistencies might often be responsible for a large part of ‘unexplained’ or ‘surprising’ poverty in- or decreases of countries, which otherwise show the same macro-economic performance.

Essay 1 empirically illustrates the biases in estimated poverty dynamics if ‘survey dynamics’, i.e. changing methods in collecting and/or processing data, are

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\(^8\)Here, aggregate poverty dynamics refer to poverty dynamics on the national level.

\(^9\)Ali Achour, Economist *Coopération Française*, Ouagadougou.
not appropriately taken into account for the case of Burkina Faso. It is shown that previous poverty assessments of Burkina Faso neglected some important survey and data inconsistencies, which led to the so-called ‘Burkinabè Growth-Poverty-Paradox’ in the 1990s, with estimated increasing poverty rates despite sustained macro-economic growth and stagnant inequality. Revised estimates, which account for ‘survey dynamics’, indicate that poverty indeed decreased between 1994 and 2003, i.e. growth did, in contrast to what previous poverty estimates suggested, significantly reduce poverty.

Whereas Essay 1 treats data limitations on income or consumption of households, Essay 2 treats data limitations on (consumption) prices of households. Whenever income is compared across space or time, real and not nominal income is of interest. Or in other words, poverty is not only determined by a lack of income but also by a lack of purchasing power, which is a function of income and prices (see also Sen, 1981). Differences in purchasing power are widely acknowledged in welfare comparisons across developing countries (e.g. Reddy and Pogge, 2005). Surprisingly, this debate has not really been carried over to compare changes in the purchasing power across time within developing countries.

Within the last decade there has been an intensive debate on whether growth accrues as much to the poor as to the non-poor. For this analysis various measures of pro-poor growth (PPG) have been defined, which have however - at least in their empirical application - ignored (different) changes in the purchasing power of households across the income distribution.

In Essay 2 it is first of all argued, that considering varying inflation rates across the income distribution is a theoretical necessity in the measurement of pro-poor growth. Moreover, for the case of Burkina Faso, it is illustrated that ignoring inflation inequality in PPG measures can severely bias empirical assessments of pro-poor growth. Hence, in Essay 2 simple methods are suggested to redress such biases, for the growth incidence curve (Ravallion and Chen, 2003) and the decomposition of poverty changes (Datt and Ravallion, 1992) as two PPG measures.

**Micro Poverty Dynamics and Missing Data**

Essay 3 and Essay 4 discuss difficulties related to missing data in the analysis of micro-level poverty dynamics. Hence, data in these two essays is not only
limited - as in Essay 1 and Essay 2 - but even completely missing. Moreover, whereas Essay 1 and Essay 2 have dealt with the \textit{ex-post measurement of poverty dynamics on the macro-level}, Essay 3 and Essay 4 address the \textit{ex-ante analysis of poverty dynamics on the micro-level}. Last, Essay 3 and Essay 4 also incorporate an analysis of the causes of poverty dynamics rather than a pure measurement of it. As argued, measurement of poverty is important but does not always help to understand why it occurs, which is important to know for policy interventions to address the causes and not only the symptoms of poverty.

Whereas comparison of poverty over time has long been undertaken on a national level it is only since recently that poverty dynamics on a household level are studied. The problem being that the former can also be analyzed with cross-sectional data whereas the latter would ideally require panel data, which is still missing for most developing countries. Hence, empirical analysis of poverty risk, or vulnerability to poverty, is still rare.

In Essay 3, which is based on joint work with Kenneth Harttgen, a simple method is proposed to empirically assess the impact of idiosyncratic and covariate shocks on households' vulnerability to poverty. The proposed method can be used in a wide context, as it relies on commonly available cross-section living standard measurement surveys (LSMS). It is an integration of multilevel modeling into Chaudhuri's (2002) approach to estimate ex-ante the mean and variance of households' consumption with cross-sectional data.

It is shown, that the previous focus on available panel data of rural areas as well as on selected shocks might have both neglected existing poverty risk in urban areas as well as underestimated the impact of idiosyncratic shocks on households' consumption. For the case of Madagascar we estimate that idiosyncratic shocks have a higher impact on both rural and urban consumption than covariate shocks. However, whereas covariate shocks have a comparatively higher impact on rural consumption, idiosyncratic shocks have a comparatively higher impact on urban households' vulnerability.

Whereas shocks cause severe wellbeing fluctuations over time, employment changes have been identified as the most important factor for a \textit{sustained} move in or out of poverty (e.g. Fields et al. 2003; Woolard and Klasen, 2005).\footnote{Moreover, also aggregated national poverty reduction is largely determined by the extent to which macro economic growth translates into employment opportunities (for the poor). See var-}
in Essay 4 the informal sector, which is said to be the labor market of the poor in developing countries, is analyzed in more detail.

One question that arises from a dynamic welfare perspective is, whether the poor are trapped into the informal sector and thus into poor earnings opportunities (market segmentation). Or, if they choose to work in the informal sector, because given their characteristics, this is actually where they can maximize their earnings (competitive markets). In other words, are individuals poor because they are employed in the informal sector or are they employed in the informal sector because they are poor(ly endowed). This question can in general only be answered from a dynamic perspective, which either requires panel or retrospective data.

However, both panel data, that would allow to track employment changes of individuals over time, as well as retrospective information on the causes of (poor) people moving into the informal sector, is missing for most developing countries. In Essay 4, which is based on joint work with Andrey Launov, an econometric model is formulated, which allows to study the dynamics of the informal sector without panel data and without information on the reasons of people working in the informal sector. The proposed method is an integration of Heckmann selection bias (1979) into finite mixture models. For the case of the urban labor market in Côte d'Ivoire it is shown that the informal sector is in fact composed of two unobserved segments, with part of informal employment being the result of labor market segmentation and the other part being the result of competitive labor markets.

**Poverty Dynamics in Africa**

As already indicated, the proposed methods for the analysis of poverty dynamics are applied to household survey data from various sub-Saharan Africa (SSA) countries; namely to Burkina Faso, with a headcount poverty rate of 46.3 percent and a HDI rank of 174,\(^{11}\) to Côte d’Ivoire, with a poverty rate of 44.0 and a HDI rank of 164, and to Madagascar, with a poverty rate of 72.1 and a HDI rank of 143 (World Bank, 2005). Here, not only the empirical implementation of previous studies of the ‘Operationalizing Pro-Poor Growth’ (OPPG) Research Program of the World Bank.

\(^{11}\)177 countries are ranked according to their HDI in the Human Development Report.
the discussed methodologies but also the consequences for our understanding of poverty dynamics are illustrated, which should be especially relevant for African countries.

It seems to be a stylized fact (see e.g. Sachs, 2005) that in the last decade poverty reduction in sub-Saharan Africa has been the slowest from a cross-country perspective or even non-existent - by almost all of the currently used concepts or definitions of poverty. An accurate measurement and understanding of the underlying poverty dynamics both on the macro as well as on the micro level, therefore, seems to be most important for these countries to eventually increase poverty reduction in the future. Moreover, especially in these poorest SSA countries is micro-economic data often very limited or even missing.

The proposed methodologies can certainly not perfectly reflect ‘true’ poverty dynamics neither on the macro- nor on the micro-level. However, they should constitute a step forward in ‘seeking true’ estimates of poverty dynamics. In addition, they can also contribute to the discussion on how the ‘time dimension’ of poverty can be integrated into standard household surveys. Last - although being empirical - the methodological discussions as well as the empirical results of the four essays should also be used as a starting point for a reflection on the current underlying theories of poverty dynamics.