Klasen, Stephan; Günther, Isabel

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Measuring Chronic Non-Income Poverty

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Measuring Chronic Non-Income Poverty[1]

Isabel Günther and
Stephan Klasen

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Department of Economics, University of Göttingen

isabel.guenther@wiwi.uni-goettingen.de

sklasen@uni-goettingen.de

Abstract:

An increasing interest in poverty dynamics has lately also led to an extensive literature on the analysis of chronic poverty. Based on Amartya Sen's groundbreaking work on capabilities and functionings static poverty measures have long used non-income indicators. In contrast, measures of poverty dynamics - including chronic poverty – have in general conceptualised poverty only in an income dimension. Hence, this paper first critically discusses the conceptual and empirical potentials and limitations of analysing chronic poverty from a non-income perspective. Second, it proposes methods to empirically measure chronic non-income poverty, with an exploratory application to panel data from Vietnam from 1992 and 1997, which demonstrates that a range of useful insights can be generated from such an analysis. In particular, we find that the correlation between chronic income and non-income poverty is rather low which is mostly due to a low correlation between income and non-income poverty in each period, while both move relatively closely over time. We also find a surprising amount of heterogeneity in static and dynamic non-income poverty within households.

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1. Introduction

In recent years, the research agenda on poverty in developing countries has moved beyond static assessments of poverty levels to consider dynamic trajectories of well-being over time. The main reason for this shift in emphasis was the recognition that there is considerable mobility of well-being over time and that only a share of the poor are affected by persistent (or chronic) poverty, while a much larger share of the total population experiences transient poverty, or vulnerability to poverty.

Since the two groups were found to be quite different in terms of their characteristics and in terms of their needs regarding policy interventions, the research community has developed two largely distinct research agendas, one focusing on chronic poverty, the other focusing on vulnerability to poverty. The research agendas complement one another, with chronic poverty focusing on poverty traps and poverty persistence and vulnerability focusing on risks and shocks and poverty dynamics.

The distinction between chronic and transient poverty is usually closely linked to conceptualizing poverty in the monetary dimension. This is largely related to the fact that the stochastic nature of the income-generating process is well-recognized in economics for decades, going back to Friedman's Permanent Income Hypothesis, which already made a distinction between permanent and transitory incomes (Friedman, 1957). In line with that hypothesis, consumption is used as the preferred welfare indicator in many applications in developing countries as it is believed to be a better reflection of long-term or permanent incomes.[2] In this sense, low consumption (i.e. consumption below a poverty line) is seen as a reflection of a chronic inability to generate sufficient incomes to leave poverty, even though households might temporarily escape income poverty.

But empirically it has been shown that in developing countries also households' consumption fluctuates greatly, in fact often not much less than income. This could be for three reasons. First, households, particularly poor households, are not able to smooth their consumption due to a lack of assets and access to credit and/or insurance markets (e.g. Townsend, 1995; Deaton, 1997). Second, 'permanent' incomes of households change as a result of permanent shocks affecting the life-time earning paths of individuals thus forcing households to re-optimize their consumption decisions. Last, consumption (and/or incomes) is measured with error and thus much of the fluctuation is spurious and related to these errors.[3]

To figure out which households are facing permanently low consumption, i.e. are chronically poor, and which households are 'only' transitory poor and which households (currently non-poor) are facing a high risk of becoming poor is thus a very important and at the same time quite difficult task and it is not surprising that a large literature has dedicated itself to this subject. And with the help of an increasing number of panel data in developing countries, dynamic assessments of consumption, i.e. an analysis of chronic poverty as well as vulnerability to poverty, have indeed become more feasible in an increasing number of countries, thus underpinning the analysis of poverty dynamics.

At the same time, this exclusive emphasis on incomes in the assessment of chronic poverty and vulnerability has clear limitations and short-comings (see also Hulme and McKay, 2005), as it is well-recognized that income (or consumption) is an inadequate indicator of well-being. If we conceptualize well-being from a capability perspective, income is but one (and for some capabilities a rather poor) means to generate capabilities such as the ability to be healthy, well-educated, integrated, clothed, housed and the like (see Sen, 1998 and Klasen, 2000); nor do equal incomes translate into equal capabilities for different individuals, due to the

[2] There are other reasons to prefer consumption to incomes as a welfare measure in developing countries. See Deaton (1997) and Deaton and Zaidi (2002).

[3] This is a difficult issue to sort out with the type of panel data available for developing countries which typically have only two or three waves and thus do not allow the application of common methods to control for measurement error (such as instrumental variable techniques).

heterogeneity of people in translating incomes into well-being. It is therefore preferable to study well-being *outcomes* directly (e.g. capabilities or functionings, see Klasen, 2000[4]) rather than study a specific well-being *input*. However, there have been few attempts to integrate the insights from the static analysis of non-income dimensions of well-being into a dynamic setting and thus investigate chronic poverty and vulnerability from a non-income perspective. In addition, apart from the conceptual advantage of studying chronic poverty from a non-income perspective, there are several advantages (but also limitations) from a measurement perspective to study non-income chronic poverty, which we discuss in more detail below.

The purpose of this paper is to try to conceptualize chronic poverty and hence also poverty dynamics from a non-income perspective and then illustrate ways to explore this topic empirically. Section 2 discusses the potentials as well as limitations of conceptualizing chronic poverty in a non-income perspective. Section 3 presents a first approach to empirically measure chronic non-income poverty, focusing on critical functionings related to health and education, using a panel survey of Vietnam from 1992/93 and 1997/98. Section 4 shows the results of this application. Section 5 concludes with highlighting open issues and suggestions for further research.

2. Conceptualizing Chronic Non-Income Poverty. Advantages and Limitations

It is clear, that in principle it should be useful to study chronic poverty in non-income dimensions (using for example applications of Sen's capability approach) as it would allow us to track well-being *outcomes* rather than simply track an important well-being *input* (income) over time. Thus it would allow us to measure well-being itself rather than only a proxy of it. The same theoretical reasoning to prefer non-income to income indicators to measure well-being as in a static framework certainly applies in a dynamic well-being framework (see e.g. Sen, 1985). In addition, there are some specific advantages (and limitations) of studying poverty using non-income indicators that emerge particularly in a *dynamic* poverty framework.

2.1 Advantages

Analyzing non-income poverty dynamics would first of all allow an assessment of the relationship between income and non-income chronic and transitory poverty. Identifying those households where the two approaches converge would identify those households who are chronically poor from a multidimensional perspective and thus possibly most deprived and arguably most deserving of support. This would enrich our assessment of dynamic well-being. Conversely, where the two approaches fail to converge in identifying the chronic poor, we would learn more about the dynamic relationship between income and non-income poverty. This is directly interesting for policy purposes as policy-makers are interested in reducing income and non-income poverty and thus knowing the temporal relationship between the two, e.g. whether improvements in income will eventually improve health outcomes (but only with a lag), or vice versa, is critical.

The measurement of non-income poverty dynamics might also shed some new light on the causes for the less than perfect correlation between income and non-income dimensions of poverty in a static framework (see e.g. Klasen, 2000). In particular, the lack of correlation at one point in time might be related more to different dynamics of the two well-being approaches, rather than the lack of a contemporaneous causal relation between the two.

[4] In principle, it is preferable to study capabilities to understand the choices people have at their disposal. In practice, we usually can only observe functionings and thus most studies are analyzing functionings instead of capabilities (e.g. Klasen, 2000).

More precisely, for example in a two-wave panel, static assessments of poverty in both periods could yield the same result regardless of whether income and non-income dimensions are used. However, the two (income and non-income) approaches could also agree in the static assessment of poverty in the first period, but differ in the dynamics between the first and second period, suggesting that different drivers affect these dynamics. Similarly, the two approaches could agree in the static assessment of poverty in the second period, but differ in the dynamics and thus would not agree in the static assessment of poverty in the first period. Lastly, the two approaches might also disagree on classifying households in both periods but agree on the dynamics over time. Thus analyzing income and non-income poverty dynamics simultaneously we are able to separate static and dynamic disagreements in identifying the poor.[5] If we only examined the two periods separately, we would either find a lack of overlap in the first period or a lack of overlap in the second period. But we would not be able to tell whether this is due to different dynamics between two periods or whether there is a permanent disagreement between the two approaches of identifying the poor.

However, even if it turned out that chronic income and non-income poverty dynamics are highly correlated, there could still be practical advantages focusing on the measurement of non-income poverty as many indicators of non-income deprivation (e.g. education or housing) are easier to measure and less prone to measurement error than income (or consumption) measures.[6] In fact, at times it may be useful to use non-income measures of well-being as instruments to correct poorly measured incomes (and or consumption).

A second measurement advantage is that information on past dynamics of non-income well-being are often easier to get and more reliable than information on past income series - even when using cross-sectional surveys. For example, it is easier to get reliable information about the educational history of a person than that person's income history. Moreover, some current non-income indicators can already provide some information about historical trends in access to critical functionings. For example, the height of an adult reflects past nutritional status and the current grade enrolled for a child at a certain age reveals important aspects of that child's past educational history.

In addition, many capabilities/functionings (e.g. education and health) can be measured at the individual level while income/consumption poverty can only be assessed at the household level due to the presence of household-specific public goods which are impossible to attribute to individual members (see Klasen, 2000; 2007a for a discussion). This therefore allows an assessment of intra-household poverty dynamics which is impossible using income data but might be quite important for studying intra-household inequalities (see also Haddad and Kanbur, 1990). This advantage, which is already present in a static assessment of poverty using a capability/functioning framework might be easily extended within a dynamic framework as we illustrate below.

2.2 Limitations

Apart from stating some advantages of an extension of chronic poverty to non-income dimensions, it is also important to name some problems. Probably the most important objection to such an extension is that it would not yield very useful new information as many non-income dimensions of well-being do not change much over time. Moreover, change in some non-income measures usually means improvements, at least in the way it is measured. The most extreme example of this would be to use years of schooling to track education poverty of individual adults. This indicator is likely to stay the same for the vast majority of

[5] If we had more waves, we could also say more about the temporal relationship between the two variables by explicitly examining leads and lags.

[6] See, for example, Zeller et al. (2006) for an example of a short-cut approach to poverty measurement using non-income indicators.

adults once they have left the educational system and if it changes, it will only go up, but never down (as surveys usually only keep track of improvements in education, but not of loss of knowledge/ skills over time).

Thus many non-income measures of well-being seem to exhibit a great deal of inertia and most non-income poor would be *chronically* non-income poor and there would be no point in distinguishing between them and the small number of transitory non-income poor (see McKay and Lawson, 2003). In contrast, the evidence on income poverty is that there is a great deal of churning and in many countries most of the poor at any point in time are transitory poor while a smaller share of households are chronically poor (see Baulch and Hoddinott, 2000).

There are several possible replies to this objection. First, to the extent that these non-income measures adequately reflect the functioning shortfall in question, the inertia in these measures correctly suggests that in many developing countries many people are chronically deprived of critical functionings. For example, those adults (of whom many are female) in developing countries that never had the chance to be schooled will be chronically educational poor. Stating this might be obvious but from a well-being perspective we need to occasionally remind ourselves that all attempts to achieve universal enrolments for children will do nothing to combat education poverty among adults. In these cases it is particularly interesting to see whether these chronically non-income poor are also chronically income poor and how the two measures are related in a static and dynamic context.

Second, some indicators of measuring non-income well-being achievements are not adequately reflecting the functioning in question. For example, adult height only reflects the nutritional status during the phase of growing up, but not the current one. Also, years of schooling say nothing about the level of functional education a person has at a point in time. To track this we would need different measures such as test scores and functional literacy and numeracy surveys which only exist in some countries (e.g. OECD, 2000). These scores are likely to move more over time and can go up or down for adults.

Third, despite the fact that a well-being indicator for an *individual* is not changing over time, it may sometimes be useful to consider a *household* perspective. For example, while being educated oneself is clearly valuable in and of itself, sometimes there are also individual benefits of education of other household members. To the extent this is the case, it might be useful to consider the average education of household members or possibly even the highest education level existing in the household (see Basu and Forster, 1998). These indicators will clearly move more over time than individuals' educational level.

Fourth, for some indicators there is considerable movement for children, but little (or no) movement among adults (e.g. years of schooling). Thus it might be useful to separately track changes in non-income poverty of children and adults which will generate different insights. Lastly, we show in Section 4 that there are a range of indicators where there is quite a lot of dynamics over time so that there indeed is an empirical justification to examine chronic (and transitory) poverty in a non-income perspective.

A second objection is that current survey instruments lack the tools to systematically track poverty in the non-income dimension. There is clearly a valid point as many surveys do not systematically track, for example, the health or nutrition status of all individuals across time using comparable measures. In the survey that we use, there are also short-coming in this respect. However, this objection can only lead to efforts to improve survey design rather than abandon this interesting approach.

A third objection is that it is difficult to interpret the linkages between income and non-income poverty dynamics for two reasons. One is the differing magnitude of measurement error in income and non-income dimensions of poverty which might make it difficult to interpret differences in chronic income vs. non-income poverty. While this is an important issue which we also discuss below, it focuses attention on the role of measurement error in the assessment of chronic poverty and a comparison between chronic income and non-income

poverty might actually help shed light on this important issue.[7] The second problem of interpretation deals with the fact that the income indicator will always refer to households, whose size and composition might have changed over time, thereby affecting the poverty status of that household. In contrast, the non-income assessment of poverty will usually focus on individuals that are present in both periods. While one indeed has to bear in mind this difference when household chronic poverty is compared with individual non-income chronic poverty, one can just as easily use the existing household boundaries to calculate non-income household poverty (as we do below).

A last objection is that when measuring non-income poverty dynamics several new conceptual questions arise. For example, what is education and health poverty among children? How can one define such poverty to be chronic or persistent? Am I education poor only if I am out of school? Or also if I am falling behind in progressing through school? Or if I also have a worsening performance? When do I become chronically education poor? Similarly, is stunting already an indicator of chronic poverty since it is related to persistent lower than required energy intake (UNICEF, 1998) or is only persistent stunting an issue? Clearly these are serious questions and below we explore the empirical impact of some choices of answers relating to these difficult questions. But also here, the call is for more work extending the concept of chronic poverty to these cases rather than to abandon the enterprise.

Thus we believe that it is well worth studying chronic non-income poverty and the approach we take here in this paper is to simply explore whether, given data and measurement constraints, reasonable ways to conceptualize and measure non-income poverty can be extended across time and whether they will generate useful additional information about static and dynamic aspects of well-being.

3. Methodology

3.1 Measurement of Chronic Poverty

To measure chronic poverty two methods have been proposed: the “spells” (McKay and Lawson, 2003) and “component” (Jalan and Ravallion, 1996) approach. The “spells” approach defines households as chronically poor who have always been poor, i.e. whose per capita household consumption has been below the poverty-line in all observed points in time. The transient poor are those who have only temporarily been poor. In contrast, the “component” approach distinguishes permanent (average) consumption of a household from temporary variations in household consumption. Hence, whereas the “spells” approach classifies households as either chronic poor or transient poor the “component” approach calculates the “chronic” and “transient” component of households’ poverty and a classification of households into chronic and transient poor households is not possible.

In this study we opt for the “spells” approach as we only have a two-wave panel at hand. We define individuals to be chronically poor in the non-income dimension if they are poor in both periods considered. Those who are poor in either period but not chronically poor are thus the transitory poor and those being poor in neither period are defined as the non-poor. In a two-wave panel it is difficult to assess whether observed transient poverty is caused by fluctuating welfare indicators or whether transient poverty is caused by individuals falling into poverty or escaping from poverty, i.e. we cannot say if we observe stochastic or structural changes in the well-being of individuals.

Similar to the income dimension, we will define ‘poverty lines’ for the non-income dimensions based on reasonable (but essentially arbitrary) notions of who should be considered as poor

[7] Also, in longer panels, it would be possible to control for this problem through appropriate econometric techniques.

in the relevant dimension (see below for details). Also, we will, in line with the literature on chronic income poverty, treat poverty in the income and non-income dimensions as a dichotomous yes/no question and thus will not consider depth or severity of poverty.[8] In addition, as both from a theoretical perspective as well as from a measurement perspective non-income poverty for adults and children is often defined and measured differently and thus should show different dynamics, we furthermore analyze poverty dynamics for these two subgroups of the population separately.

3.2 Indicators of Non-Income Poverty

The question arises which non-income indicators should be analyzed. Whereas for a theoretical discussion of temporary and long-term well-being an analysis of a very broad range of functionings might be appropriate, when undertaking empirical studies it should be more useful to focus on a smaller sub-set of basic functionings. We therefore focus on education and health (approximated with the nutritional status of individuals[9]), since these are probably some of the most critical and commonly agreed capabilities (Hulme and McKay 2005). These non-income indicators have the additional advantage that they are measured at the individual level in contrast to e.g. housing or service access which can (as income) only assess chronic poverty of households.

For children, who are below the age of 18 years we use stunting as an indicator of health or nutritional deprivation whereas for adults of 18 years and older we use the body mass index (BMI). Moderate (severe) undernutrition (or nutrition poverty) is defined as being below a z-score of - 2 for children or being below a BMI of 18.5 for adults.

The z-score is calculated as the height for a child minus the median height of a reference standard (of children of the same age), divided by the standard deviation of that reference standard. The reference standard used is the commonly used US-based reference standard recommended for use by the World Health Organization (WHO) for monitoring undernutrition everywhere since 1987 (see Klasen, 2007b for further details).

While most analysts agree that the z-score is particularly accurate in measuring nutrition problems of children below the age of 6, there are questions with regard to its applicability to populations outside the US for children older than the age of 6, as growth after 6 seems to differ even in well-nourished populations across the world (see WHO, 1995 for a discussion). Thus one should view the application of this indicator until the age of 18 with some caution.

One should also note that this measure of anthropometric shortfall essentially makes a probabilistic assessment of the likelihood that a child is undernourished. As a result, some well nourished children might be wrongly classified as undernourished because they have genetically short parents while other children might wrongly be classified as well nourished even though they are undernourished but this does not show up in their height due to their genetically tall parents. Thus we expect some noise in these anthropometric data. However, while this noise will affect static assessments of undernutrition, it should not seriously affect the dynamics of undernutrition..

For adults, height is not an indicator of current nutritional status and the BMI as a measurement for undernutrition is thus chosen instead. The BMI is defined as the weight in kg divided by the height squared in meters of individuals. While a low BMI is surely an

[8] Clearly, considering depth and severity of income and non-income poverty and considering the correlations between income and non-income dimensions in them would yield additional useful information and should be considered in further work.

[9] In an earlier version, we also considered a morbidity indicator, but this measure only captured very recent illnesses and not a more general health status and is therefore not very suited for an analysis of 'health' poverty. Clearly, this is an issue that could be solved with including more detailed health questions in household surveys. See Schultz (2002, 2003) for a discussion of particularly useful health indicators.

indicator of severe nutritional problems, the precise cut-off is controversial. Also, due to secular changes in dietary patterns and exercise in developing countries, malnourished people might still have an adequate BMI or even show up as overweight, but still lack important nutrients and access to healthy foods. Thus some 'health' poor might not be captured using this indicator.[10]

Moderate (severe) education poverty for adults of 16+ years of age is defined as having less than 9 (4) years of education. Moderate education poverty for children of 6-15 years of age is defined as being out of school within the first 9 (4) years of education. 4 years of education refer to completed primary school. 9 years of education refer to completed lower secondary school. In addition, we do not only consider children who have been in school in one observation period but not in school in the other observation period as transient poor, but also those children who were in school in both observation years n and n+t, but did not complete t years of schooling during the observation period, are considered as transient poor.

Clearly, while the choice of the schooling variable seems defensible for adults, the choice is somewhat arbitrary for children. One could equally well consider only those children who are out of school in the two observation periods as poor as well as consider all children who are behind in their educational program considering their age (in either years) as educational poor. This would include children who are behind in their education program already in the first observation period as well as children who fall behind during the observation period, i.e. children who progress less than the number of years between the two waves of the panel. All of these problems could be circumvented by the use of educational test scores, but hardly any household surveys, let alone panel surveys, collect such data on a regular basis.

Examining several non-income indicators which is inevitable when studying well-being from a functioning/capability perspective, the question of an appropriate aggregation and weighting arises if one wants to generate summary measures of well-being (e.g. Atkinson and Bourguignon, 1991 and Ramos and Silber, 2005). Alternatively, one can simply report the individual functionings/capabilities without weighting and aggregating them, thus generating partial orderings of well-being outcomes.

In this study, we opt for the latter approach and did not calculate a composite indicator but examine chronic and transitory deprivation in these indicators separately. In addition to the usual problems that emerge when aggregating and weighting different non-income indicators, it is particularly difficult to interpret such a composite measure in a dynamic perspective, as different non-income indicators show quite different dynamics. For example, education poverty using our indicators is largely irreversible as people have reached adulthood, while nutrition poverty can be reversed as general conditions improve. Moreover, when analyzing multidimensional poverty in a dynamic perspective not only the aggregation and weighting of different non-income indicators becomes an issue but also how to do this over time.[11].

3.3 Research Questions

Applying the described non-income indicators to the study of chronic underdevelopment, we first analyze if and to what extent income and non-income indicators show the same poverty dynamics. We study both the level of chronic (and transient) non-income and income poverty as well as the correlation of income and non-income poverty dynamics. The first analysis assesses from a macro-perspective whether the same share of individuals suffer from

[10] See for example, Henderson (2005) for a discussion.

[11] For example, should an individual who is poor in one dimension in the first period but not so in the latter, but who is *not* poor in a second dimension in the first period, but poor in the second period be considered as chronic poor (deprived of one non-income dimension in either period) or as transient poor (altering deprivation).

chronic income and non-income poverty whereas the latter approach analyses from a micro-perspective if the same individuals would be identified as chronically poor whether income or non-income indicators are used.

In a second step we study individual poverty dynamics within households, which includes an analysis of the differences between individual and household poverty dynamics, as well as intergenerational poverty dynamics, which analyzes the persistence of poverty of different generations living in the same household. Such an analysis of individual chronic poverty is usually not possible with income indicators.

Last, we might also define chronic poverty as multi-dimensional poverty, i.e. examine the number of dimensions of deprivation (including income and non-income dimensions) at a point in time and over time.

3.4 Data

The data we use is the Vietnam Living Standard Survey (VLSS), which is a two wave panel conducted in 1992/1993 and 1997/1998. The first round comprises a sample of 4,799 (23,838) and the second round a sample of 5,999 (28,509) households (individuals). 4,305 of these households were interviewed in both years, which allows to track 17,829 individuals over a 5 years time period. As we limited our analysis to households and individuals that were present in both years, there might be a problem of attrition bias in the sense that the households and individuals studied do not fully represent the population. However, simple probits indicate that the attrition bias in the VLSS is quite low, i.e. basically random (Baulch and Masset, 2003).

Also children below the age of 5 years in 1997 are excluded from the sample as they were not yet born in 1992. For comparison with non-income poverty dynamics we also calculate income poverty dynamics. We define moderate poverty as per capita household consumption below the official poverty line and severe poverty as per capita household consumption below the official food poverty line. The official (food) poverty line, which is provided by the General Statistical Office in Vietnam, is 1.160.000 (750.000) Vietnamese Dong for 1992 and 1.790.000 (1.287.000) Vietnamese Dong for 1997, respectively. Note that in this study we use per capita household consumption.[12]

4. Empirical Results

4.1 Levels of Chronic Poverty

Table 1 shows the extent of chronic and transient poverty measured with income and non-income indicators. Depending on the measures we use (and whether we observe adults or children) we come to quite different conclusions about poverty dynamics and the level of chronic poverty in Vietnam.

In general one can however state that nutritional and particularly educational well-being, with a transient poverty component of 25.8% and 15.0% respectively, fluctuate less than income poverty, with a transient poverty component of 33.0%. Also, the well-being of adults seems to be much more stable than the well-being of children. Whether stable well-being is positive or negative from a normative perspectives depends on whether an individual is poor or non-poor in a certain well-being dimension. For the poor, steady indicators mean poverty traps,

[12] We thus do not apply equivalence scales. White and Masset (2003) have recently shown the "bias" induced by ignoring household size and composition on poverty profiles for Vietnam in a static context. In a further study it might hence be interesting to analyze the impact of equivalence scales (and hence also household dynamics) on measured income (or consumption) poverty dynamics; see also the discussion on household size below.

for the non-poor steady indicators mean higher permanent well-being. But for all human development indicators (except education for adults) there is a significant transient component, i.e. it is well worth studying the dynamics of non-income dimensions of well-being.

Table 1 : Poverty Rates and Dynamics

	Income			Nutrition			Education		
	Total	**Adult**	**Child**	**Total**	**Adult**	**Child**	**Total**	**Adult**	**Child**
Poverty 1992	61.5	56.6	69.7	43.2	33.6	54.9	58.1	64.1	29.4
Poverty 1997	34.2	31.2	40.3	34.5	30.9	41.5	49.7	57.9	17.7
Chronic	31.4	27.8	38.2	26.0	23.0	32.6	43.7	57.9	14.6
Transient	33.0	32.2	33.6	25.8	18.6	29.7	15.0	6.2	32.9
Non-Poor	35.6	40.0	28.2	48.2	58.4	37.7	31.3	35.9	52.5

Some important cautionary remarks have to be made concerning the interpretation of poverty dynamics across different well-being dimensions. The first issue relates to the fact that we often only have a two wave panel at hand, where high income transient poverty might largely be caused by general economic development. In our case, Vietnam experienced significant economic growth which has led to a massive decrease in income poverty in Vietnam between 1992/1993 and 1997/1998 (see also Bonschab and Klump, 2007), with the headcount poverty rate falling from about 61% to 34%. All measures of non-income poverty show much smaller improvements.

With a two wave panel in this economic boom environment, it is therefore difficult to distinguish whether high income poverty dynamics are caused by income fluctuations or by a move out of structural poverty of a large part of the population. Likewise, we do not know if we observe higher chronic non-income poverty because human development indicators are more stable (i.e. are less volatile) or because they adjust slower (i.e. with some delay) than income indicators to economic development. The interesting question here is then if dynamics of non-income indicators rather reflect past- whereas income poverty dynamics reflect current poverty dynamics.

In addition, differences between income and non-income poverty dynamics might also be explained by the somewhat “arbitrarily set” level, i.e. poverty line, in different poverty dimensions. In other words, chronic poverty rates are certainly positively correlated with the extent of total poverty and negatively related to poverty reduction (or increases) over time, i.e. the higher the static poverty rate the higher chronic poverty and the higher poverty reduction (or increase) the higher transient poverty. Hence, differences in the extent of chronic poverty using income and non-income indicators might just steam from the fact that the extent of total (static) poverty rates is different.

We deal with this potential measurement problem by equalizing poverty rates across the different indicators. For example, Table 2 shows “fitted” income poverty rates for the case of nutritional and income poverty, where we first align income poverty rates to the level of nutrition poverty in 1992, i.e. the consumption poverty line is endogenously set so that total static income poverty rate is equal to the level of static nutrition poverty in the first year. If we do this, the share of transitory income poverty remains about the same and much higher than

the share of transitory nutrition poverty, while the share of chronically poor falls as expected. Thus the higher transitory component is not related to the initial setting of the poverty line. If, however, we equalize income total (static) poverty rates to nutritional (static) poverty rates in both years 1992 and 1997, the differences between income and non-income chronic and transitory poor largely disappears; thus much of the transitory component of income poverty is indeed related to a quicker escape from income than non-income poverty in Vietnam during that era. However, if we adjust income poverty rates to education poverty rates in both year, still the transient component of income poverty is much higher than the transient component of educational poverty, indicating that educational well-being is indeed much more stable over time than income poverty (and nutritional poverty).

Table 2: Poverty Dynamics using Fitted Income Poverty Rates

	Income	Nutrition	Income adj. to Nutrition		Education	Income adj. to Education	
Poor 1992	61.5	**43.2**	**43.2**	**43.2**	**58.1**	**58.1**	**58.1**
Poor 1997	34.2	**34.5**	17.0	**34.5**	**49.7**	30.8	**49.7**
Chronic Poor	31.4	26.0	14.6	26.4	43.7	27.7	41.5
Transient Poor	33.0	25.8	31.2	25.1	15.0	33.6	24.9
Non-Poor	35.6	48.2	54.2	48.5	31.3	38.7	33.6

Note: In the first set of adjusted poverty rates we adjust the income poverty rate to the nutritional (educational) poverty rate in the first year and then inflate it with the inflation rate implied by the official poverty line inflation between 1992 and 1997, while in the second adjustment we adjust income poverty rates in both years to nutritional (educational) poverty.

Two further measurement issues that might explain the higher transient component in income poverty dynamics are household dynamics and measurement error. As stated above, we consider the total household for a calculation of per capita incomes and thus income poverty while we only consider individuals present in both surveys for our non-income analysis. Household dynamics, i.e. increasing or decreasing households size, will have a significant influence on per capita income and thus affecting poverty dynamics (by affecting the denominator by which while existing household income is divided or by additionally affecting the numerator if the additional person is contributing incomes), while they do not directly affect the non-income well-being of individuals tracked (see discussion in 4.3). With regard to measurement error, income (or consumption) are likely to be measured with higher measurement error than non-income indicators, thus a considerable part of transient income poverty might indeed be caused by measurement error. And with only a two-wave panel at hand there is little scope for appropriate instruments to control for measurement error (see Woolard and Klasen, 2005 for a discussion). Bhatta and Sharma (2006) have nevertheless lately applied the proposed method of Luttmer (2002) of error-adjusted consumption measures to a two wave panel in Nepal, which might deserve further consideration, although some rather stringent assumptions have to be made.

4.2 Correlation of Poverty Dynamics

Even if national levels of income and non-income poverty were the same at a point in time or across time, it could still be the case that the income chronic (transient) poor are different from the non-income chronic (transient) poor, i.e. depending on the measures used we might identify different households (individuals) as chronically poor. This is most important from a policy perspective as it would affect the targeting of anti-poverty policies.[13]

[13] See Klasen (2000) for a discussion in a static context.

Table 3 illustrates the correlation between income and the diverse non-income poverty dynamics. The numbers show row percentages, i.e. they show the percentage of the income chronic (transient, non-) poor that are also non-income chronic (transient, non-) poor, i.e. each row sums up to 100%.[14]

Although there is a positive correlation between income and non-income poverty dynamics the correlation is quite low. In fact, it is astounding how many chronic income poor are never poor in a nutrition and education perspective and vice versa.[15] For example, 39.0% of the chronic income poor are never nutritionally poor. The correlation is even lower for transient poverty. For example the likelihood to be nutritionally transient poor does not (or not much) increase if the individual is income transient poor. 27.5% of the chronic income poor as well as only 27.5% of the transient income poor is also nutritionally transient poor.

Table 3: Correlation of Income and Non-Income Dynamics

	Nutrition			Education		
Income	**Chronic**	**Transient**	**Non-Poor**	**Chronic**	**Transient**	**Non-Poor**
Chronic	33.5	27.5	39.0	49.8	18.7	31.6
Transient	26.9	27.5	45.6	43.4	15.8	40.9
Non-Poor	18.5	22.6	58.9	39.3	11.3	49.3

One could again argue that part of the low correlation between income and non-income indicators is a consequence of general differences in poverty levels (see previous Section). However, if we use fitted income poverty dynamics, i.e. we set income poverty rates in 1992 and 1997 equal to nutritional and educational poverty, the correlation between income and non-income poverty dynamics does not improve significantly (Table not shown here). This low correlation between the income and non-income poverty dynamics even if we use fitted income poverty rates could then be explained by two other major factors which we explore in turn: Either there is already a low correlation between different dimensions of static poverty (see Table 4) or different dimensions of well-being show very different dynamics (see Table 5).

Table 4 shows the static correlation between income and non-income poverty in 1992 and 1997. Each year and each human development dimensions sums up to 100%. It can be observed that the income poor are not necessarily the non-income poor. For example in 1992, 29.9% of the population is both income and nutrition poor whereas 25.3% of the population is neither income nor nutrition poor. However, 44.9% of the population is either income poor and not nutritional poor or nutritional poor but not income poor. In 1997, due to significant economic development in Vietnam in the 1990s, the share of the poor in both dimensions has decreased whereas the share of the non-poor in both dimensions has significantly increased, but still 40.0% of the population is only poor in one dimension but not poor in the other. The same trends can be observed if we analyze educational poverty instead. Thus the extent of differences in static poverty is very large, in fact larger as in

[14] Alternatively, one could have calculated the percentage of the non-income chronic (transient, non-) poor which are also income chronic (transient, non-) poor. As we came to the same conclusions applying this latter approach, we only report the former.

[15] See Baulch and Massett (2003) for a similar finding.

some other studies where income poverty was compared with composite non-income measures of well-being (e.g. Klasen, 2000).[16]

Table 4: Correlation of Static Income and Non-Income Poverty

	Nutrition 1992		Education 1992	
Income 1992	**Poor**	**Non-Poor**	**Poor**	**Non-Poor**
Poor	29.9	31.6	31.3	27.9
Non-Poor	13.3	25.3	18.7	22.1

	Nutrition 1997		Education 1997	
Income 1997	**Poor**	**Non-Poor**	**Poor**	**Non-Poor**
Poor	14.5	19.9	17.0	16.8
Non-Poor	20.1	45.7	26.7	39.5

To separate differences in static poverty from differences in dynamics across the various well-being dimensions, in Table 5 we analyze the correlation of different poverty dynamics of only those individuals who show the same static well-being in 1992. More precisely, we only analyze those individuals who were either both income and non-income poor or *neither* income nor non-income poor in 1992. Hence we exclude those individuals which were poor in one but not in the other well-being dimension. The figures show row percentages, i.e. show the percentage of income chronic (transient, non-) poor that are non-income chronic (transient, non-) poor. It should be clear that if we exclude individuals who were initially income poor but not non-income poor (and vice versa), there can be no individuals who are chronically poor in one dimension but non-poor in another dimension.

Table 5: Correlation of Income and Non-Income Dynamics

	Nutrition			Education		
Income	**Chronic**	**Transient**	**Non-Poor**	**Chronic**	**Transient**	**Non-Poor**
Chronic Poor	65.3	34.7	0.0	87.9	12.1	0.0
Transient	52.9	38.2	8.9	80.9	15.0	4.1
Non-Poor	0.0	11.4	88.6	0.0	12.1	87.9

Notes: Only initial poor / non-poor in both income and non-income dimension are considered.

If we analyze differences in pure poverty dynamics, i.e. poverty dynamics controlled for differences in static poverty, the correlation between poverty dynamics of income and non-income indicators increases significantly. Especially the income non-poor also seem to stay non-income non-poor: approximately 80% of the income non-poor also stay non-poor in other dimensions of well-being. To a large extent also the chronic income poor remain (chronically) poor in non-income dimensions. In contrast the transient income poor, i.e.

[16] Part of this difference is, as discussed above, surely related to the 'noise' in the anthropometric indicator which only gives a probabilistic assessment of a true nutritional deficit of an individual,

mostly those individuals who move out of poverty, often stay chronically poor in other dimensions, which could be caused by delayed dynamics, where non-income indicators change *after* income well-being has changed (i.e. transient non-income poverty reflects past poverty dynamics whereas transient income poverty reflects current poverty dynamics).

In general though, the dynamics of income and non-income poverty are more similar than their static correlation which is an interesting and important finding. It suggests that the (unmeasured) characteristics that affect this lack of static correlation between income and non-income poverty do not change much over time as the dynamic correlation for those who were identified as poor/non-poor in both dimensions is quite similar.

4.3 Household Non-Income Poverty Dynamics

As discussed above, a particular advantage of examining non-income dimensions of well-being is the ability to study intra-household differences in well-being levels and trends. In this section we explore household non-income poverty dynamics, i.e. analyze the difference between (aggregate) household and individual non-income poverty dynamics, which cannot be captured by income or consumption measures of poverty dynamics which always assume that either everyone or no one in the household is income poor. Differences in household and individual poverty dynamics might, as already discussed above, also be partly responsible for the very low correlation between income and non-income poverty dynamics, with the former measuring household and the latter measuring individual poverty dynamics.

Table 6 shows intra-household poverty dynamics of the various non-income indicators. The indicated percentages refer to individuals (or adults and children) who live in households where all members are chronically, transient or non-poor (homogenous poverty dynamics) or where some are transient while others are chronically poor or non-poor, or where some household members are chronically poor whereas others are non-poor (heterogeneous poverty dynamics). One should be very cautious looking at the total population and should rather analyze adults and children separately, as a lot of differences in poverty dynamics between adults and children is caused by differences in measurement (e.g. the nutritional status of adults is measured weight over height, whereas the nutritional status of children is measured height over age).

Whether we look at nutrition or education, the percentage of individuals who live in households where all adult or child members show the same poverty dynamics is only around 40-60%. What is most surprising is that up to 1/3 of individuals even live in households where some household members are never poor in a particular non-income dimension while others are always poor in that same dimension.

This high heterogeneity of individual poverty dynamics within households can also explain part of the low correlation of income and non-income poverty dynamics at the micro-level (Section 4.2) as well as on the aggregate macro-level (Section 4.1). In contrast to non-income indicators, income indicators ignore differences in poverty dynamics within households. We illustrate this in Table 7, where we compare *individual* nutritional (and educational) poverty rates with per capita *household* average nutritional (and educational) poverty rates. If we use the household average instead of individual rates the transient poverty rate (relative to the chronic part) becomes significantly larger. So part of the lower transient non-income poverty rate - in comparison to income poverty - stems from the fact that we use individual instead of average household (scaled up to household members) well-being indicators. If one individual improves his/her welfare all other household member become better/worse off as well, so we artificially increase transient poverty if we work with household means. Also absolute chronic poverty rates change significantly if we work with household averages instead of individual poverty rates. But whereas for the nutritional poverty rate the chronic component decreases – in comparison to individual rates - for the educational poverty rate chronic poverty would significantly increase if we worked with household poverty rates.

Table 6: Household Non-Income Poverty Dynamics

	Nutrition			Education		
	Total	**Adult**	**Child**	**Total**	**Adult**	**Child**
Homogenous Non-Income Poverty Dynamics						
Chronic Poor	2.5	7.1	13.7	9.1	37.7	2.2
Transient Poor	1.4	4.5	9.5	0.1	1.1	10.3
Non-Poor	11.7	34.5	20.7	14.8	18.0	53.1
	15.6	46.1	43.9	24.0	56.8	65.6
Heterogeneous Non-Income Dynamics						
Transient & Chronic Poor	6.8	6.9	18.8	10.9	5.8	2.7
Transient & Non-Poor	22.4	18.9	16.2	8.2	3.4	28.1
Chronic & Non-Poor	55.3	28.1	21.1	56.8	34.0	3.7
	84.5	53.9	56.1	76.0	43.2	34.4

Table 7: Average Household Poverty Dynamics

	Nutrition		Education	
	Individual[a)]	**Household[b)]**	**Individual[a)]**	**Household[b)]**
Poverty 1992	33.6	25.7	64.1	77.6
Poverty 1997	30.9	21.6	57.9	72.6
Chronic	23.0	14.5	57.9	70.4
Transient	18.6	18.9	6.2	9.2
Non-Poor	58.4	66.6	35.9	20.4

Notes: [a)] Poverty rates refer to the individual BMI and years of schooling for adults 18+. [b)] Poverty rates refer to per capita average household BMI and schooling. Rates only for adults of age 18+.

Lastly, non-income well-being indicators, or intra-household poverty dynamics can also be used to analyze long term (intergenerational) poverty dynamics, which is usually not possible with income indicators. Intergenerational chronic poverty, which refers to poverty that is passed from one generation to the next, i.e. the most severe form of chronic poverty, can be assessed by comparing the well-being of two generations within the same households. Table 8 shows nutritional and educational poverty for all households, where at least two generations were present in the household.[17] *Poor Elderly* indicates the poverty rate of individuals of the older generation within a household, whereas *Poor Young* refers to the

[17] Poverty rates were calculated based on the average consumption, BMI and educational level of adults older than 18 years belonging to one of the two generations within households.

poverty rate of individuals belonging to the younger generation within a household. *Poor* refers to individuals that are living in households where both the older and younger generations are poor, i.e. where intergenerational chronic poverty persists. By definition, all generations within the same household are either income poor or not. However, there is quite a significant share of individuals who live in households where one generation is non-income poor whereas the other generation is not non-income poor. But a large part of individuals live in households where particularly educational poverty is passed from one generation to the next, and we should very much be concerned about these households where poverty persists over very long time horizons.

Table 8: Intergenerational Chronic Poverty (1997)

	Income	Nutrition	Education
Poor Elderly	31.1	24.4	67.6
Poor Young	31.1	22.6	55.5
Poor	31.1	8.9	50.7
Poor/Non-poor	0.0	34.8	31.9
Non-Poor	69.9	56.4	17.4

Notes: Rates are shown for the cross-section data of 1997. However, we obtain the same trends if we use the data from 1992 instead.

4.4 Multi-dimensional Poverty is Chronic Poverty

Several authors have argued that chronic poverty might also be characterized by multidimensional poverty (see e.g. Hulme, Moore and Shepherd, 2001), i.e. individuals who are poor in several dimensions are more likely to stay chronically poor. We test this hypothesis by analyzing the correlation of the number of dimensions an individual is deprived of in 1992 and 1997 in Table 11. For example 7.3 % of the total population have been poor in one well-being dimension in 1992 and in one well-being dimension in 1997, whereas 4.1% of the population have been poor in all three dimensions (income, nutrition and education) in 1992 and 1997.

Table 9: Chronic Poverty as Multidimensional Poverty

	1997			
1992	**non dimensional**	**one dimensional**	**two dimensional**	**three dimensional**
non dimensional	11.6	2.6	0.4	0.0
one dimensional	10.5	19.4	4.0	0.5
two dimensional	3.9	14.7	15.8	3.5
three dimensional	0.4	2.9	6.2	4.1

What is striking is that although the correlation of poverty dynamics of different well-being indicators seems to be rather low, i.e. moving out of income poverty does not mean moving out of non-income poverty (and vise versa), the number of well-being dimensions an individual is deprived of seems to be quite stable over time. 50% of individuals have not changed the number of dimensions in which they are poor (the sum of the diagonal shares)

and very few (8.2%) have changed by more than one dimension. This finding could to some extent even explain the low correlation of income and non-income poverty dynamics, if we assume that poor individuals alternate between, for example, low educational or low health functionings or between income and non-income poverty. So here the extent of poverty would be defined as the number of well-being dimensions a person is deprived of. If she is poor in one dimension in one year it is very likely that she is also poor in one dimension in the following years, but the dimension can change. One intriguing interpretation would be that individuals are forced to choose between different forms of deprivation and make different choices over time. This issue certainly deserves closer attention in future research.

5. Conclusion and Further Research

The main findings from this exploratory analysis to study chronic poverty and/or poverty dynamics from a non-income perspective are first, that there are sound theoretical as well as practical empirical arguments for moving in such a direction. It generates important new insights about the dynamics of well-being outcomes over time, their relationship to incomes, and intra-household and inter-generational dynamcs. In particular, in our empirical assessment there is more dynamics in non-income dimensions of poverty than commonly presumed although non-income poverty is certainly more stable over time than income poverty. Moreover, the correlation between chronic poverty in the income and non-income dimensions is very low. This seems to be mostly caused by the low static correlation between the two than by different dynamics over the observed period. Forth, we observed a rather high heterogeneity in intra-household non-income poverty dynamics, which would not be captured by income poverty measures. Last, the number of well-being dimensions individuals are deprived of is surprisingly stable over time. Given the limitations of the data we had at our disposal, these are interesting findings worth exploring more.

But clearly one implication of our research is that more effort must be directed into generated comparable panel data sets that fully capture important non-income well-being outcomes in a comparable fashion. Among the most important improvements to tackle are better measures of health status (see Schultz 2002, 2003 for possible suggestions) and the inclusion of educational test scores for all in the household.

In addition, this largely descriptive analysis leaves a number of questions unanswered which should be the topic for further research. Most important is a formal regression-based analysis of the determinants of income and non-income poverty dynamics to further understand the surprisingly low correlation between the two as well as the high heterogeneity of poverty dynamics within households. To date, most related regressions have only examined the determinants of chronic and transient income poverty where some non-income dimensions of well-being (particularly human assets such as health and education) are seen as important determinants (e.g. Woolard and Klasen, 2005). Such regression approaches could be extended to also explain dynamics of non-income poverty. Controlling for measurement error and endogeneity will clearly be an issue here, which can be more easily achieved if one can use lagged values as instruments in panels that have more than two waves. Such analyses should usefully consider the actual levels of income and non-income deprivation rather than based on dichotomous poverty definitions as used here in our exploratory analysis.

Secondly, the question of household structure dynamics and equivalence scales deserves closer examination. As shown for example by Woolard and Klasen (2005), changes in household size and structure are an important determinant of income mobility over time and we also know that static poverty assessments are sensitive to equivalence scale assumptions. Both of these issues were raised here but deserve further analysis, particular when comparing income to non-income poverty dynamics.

Thirdly, one can examine the whole *distribution* of income and non-income well-being dynamics, i.e. using continuous measures rather than dichotomous indicators to study chronic poverty in a non-income dimension. Here the research of Grosse, Harttgen and Klasen (e.g. Grosse, Harttgen and Klasen, 2005, 2006; Klasen, 2005) in combination with the work of Grimm (2005) could be extended to study non-income poverty dynamics across the entire well-being distribution of households.

A fourth interesting extension of our work would be to derive multidimensional measures of non-income poverty dynamics, which go beyond a partial ordering of well-being outcomes. The challenging question here is not only how to weight and aggregate different well-being dimensions but in addition how to weight and aggregate different time dimensions. Such work could build on studies by Bossert and D'Ambrosio (2006) and Chakravarty and D'Ambrosio (2006) who axiomatically derive relative and absolute measures of social exclusion, i.e. chronic capability failure. For them, social exclusion is the (weighted) sum of individual functionings from which an individual is excluded over time. The paper is much concerned with the aggregation to a social exclusion score for the society and with comparisons with other societies using dominance relations, which could be a helpful start for such work. In this context, it might also be fruitful to combine the study of Duclos et. al (2006) with the one of Gräb and Grimm (2006), with the former concentrating on robust multidimensional and the latter focusing on robust multi-period poverty comparisons in non-income dimensions.

Lastly, one can more systematically examine whether some households are chronically worse at turning incomes into non-income achievements. This can be done by examining the persistence of positive and negative residuals of non-income regressions among households across time or applying quantile regressions. This would uncover and define households that are chronically underperforming in turning incomes into functionings as chronically poor. Such households as well as those identified to be multidimensionally poor in a dynamic perspective are the households most urgently in need of support.

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