

Measuring chronic non-income poverty

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## Abstract

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 conceptualized poverty only in an income dimension. Hence, this paper first critically discusses the conceptual and empirical potentials as well as the 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, and 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. This 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. However, our analysis also shows that longer panel data with more comprehensive information on non-income dimensions of wellbeing would be needed.

*Key words:* chronic poverty, non-income indicators, intrahousehold dynamics, Vietnam.

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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 wellbeing over time. The main reason for this shift in emphasis was the recognition that there is considerable mobility of wellbeing 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 their needs regarding policy intervention, the research community has developed two largely distinct research agendas: one focuses on chronic poverty, the other on transient poverty or 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 has been well-recognized in economics for decades, going back to Friedman's permanent income hypothesis, which made the distinction between permanent and transitory income (Friedman 1957). In line with that hypothesis, consumption is the preferred welfare indicator in many applications in developing countries as it is believed to be a better reflection of long-term or permanent income.<sup>1</sup> In this sense, low consumption (i.e. consumption below a poverty line) is seen as a reflection of a chronic inability to generate sufficient income to leave poverty, even though households may temporarily escape income poverty.

But empirically it has been shown that in developing countries the consumption of households also fluctuates greatly, in fact often almost as much as income. Three reasons may account for this. 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. And last, consumption (and/or incomes) is measured with error and thus much of the fluctuation is spurious and related to these errors.<sup>2</sup>

To determine which households permanently face low consumption, i.e. which are chronically poor, which households are 'only' transitory poor and which households (currently non-poor) face a high risk of becoming poor is thus a very important and quite a difficult task. It is not surprising that a large literature has been dedicated to this subject. And as panel data increase in the 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 many countries, thus underpinning the analysis of poverty dynamics.

At the same time, this exclusive emphasis on income in the assessment of chronic poverty and vulnerability has clear limitations and shortcomings (see also Hulme and McKay 2005), as it is well-recognized that income (or consumption) is an inadequate indicator of wellbeing. If we conceptualize wellbeing from a capability perspective, income is but one means (and for some capabilities a rather poor one at that) for generating such capabilities as the ability to be

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<sup>1</sup> There are other reasons to prefer consumption over incomes as a welfare measure in developing countries; see Deaton (1997) and Deaton and Zaidi (2002).

<sup>2</sup> 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 (such as instrumental variable techniques) to control for measurement error.

healthy, well-educated, integrated, clothed, housed and the like (see Sen 1985, 1999; Klasen 2000). Nor do equal incomes translate into equal capabilities for different individuals, due to the heterogeneity of people in translating income into wellbeing. It is therefore preferable to study wellbeing *outcomes* directly (e.g. capabilities or functionings, see Klasen 2000)<sup>3</sup> rather than study a specific wellbeing *input*. However, there have been just a few attempts to integrate the insights from the static analysis of non-income dimensions of wellbeing 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 this perspective, there are several advantages (but also limitations) from a measurement perspective in studying non-income chronic poverty. We discuss these 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 introduces the first approach to empirically measure chronic non-income poverty focusing on critical functionings related to health and education, with the use of a panel survey from Vietnam from 1992/93 and 1997/98. Section 4 presents the results of this application, while Section 5 concludes and highlights open issues and suggestions for further research.

## 2. Conceptualizing chronic non-income poverty

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

### 2.1 Potentials

Analysing non-income poverty dynamics would, first of all, allow an assessment of the relationship between income and non-income chronic and transitory poverty. Identifying households where the two approaches converge would identify those households who are chronically poor from a multidimensional perspective and who could thus possibly be the most deprived and arguably the most deserving of support. This would enrich our assessment of dynamic wellbeing. Conversely, if 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 has direct relevance for policy purposes as policymakers are interested in reducing poverty in both income and non-income dimensions. Thus it is vital to recognize 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.

The measurement of non-income poverty dynamics might also shed some new light on the causes of 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 more related to different dynamics of the two wellbeing approaches than the lack of a contemporaneous causal relation between the two. More precisely, for

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<sup>3</sup> In principle, it is preferable to study capabilities to understand the choices people have at their disposal. In practice, usually we can observe only functionings and thus most studies analyse these instead of capabilities (e.g. Klasen 2000).

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 be consistent 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 differ in the classification of households in both periods but agree on the dynamics over time. Thus by analysing income and non-income poverty dynamics simultaneously, we are able to separate static and dynamic discrepancies in identifying the poor.<sup>4</sup> If the two periods are examined separately, we would find either a lack of overlap in the first period or in the second period. But we would not be able to determine whether this was due to different dynamics between two periods or whether there are permanent inconsistencies between the two approaches in identifying the poor.

However, even if chronic income and non-income poverty dynamics were highly correlated, there could still be practical advantages to 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.<sup>5</sup> In fact, at times it may be useful to use non-income measures of wellbeing as instruments to correct poorly measured incomes (and/or consumption).

Another measurement advantage is that information on past dynamics of non-income wellbeing is often not only easier to obtain but also more reliable than information on past income series – even when using cross-sectional surveys. For example, it is easier to get reliable information on an individual's educational history than his income history. Moreover, certain current non-income indicators can already provide information on historical trends in access to critical functionings. For example, adult height reflects past nutritional status, and the current grade of a child at a certain age reveals important aspects of his 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 because the existence of household-specific public goods are impossible to attribute to individual members (see Klasen 2000, 2007a for a discussion). Therefore, this allows an assessment to be made of intrahousehold poverty dynamics, which would be impossible with income data but which could be quite important for studying intrahousehold inequalities (see also Haddad and Kanbur 1990). This advantage, already present in a static assessment of poverty that uses a capability/functioning framework, could easily be extended within a dynamic framework, as we illustrate below.

## **2.2 Limitations**

Apart from highlighting some advantages of extending chronic poverty to non-income dimensions, it is also important to mention some of the problems. Probably the most important drawback is that it would not yield new useful information, as many non-income dimensions of wellbeing do not change much over time. Moreover, change in some non-income measures generally means improvement, at least in the way it is measured. The most extreme example of this would be to use the years of schooling to track education poverty of individual adults. This indicator is likely to stay the same for the vast majority of adults once

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<sup>4</sup> Had more waves been available, more information could have been gained about the temporal relationship between the two variables by explicitly examining leads and lags.

<sup>5</sup> See, for example, Zeller et al. (2006) for an example of a shortcut approach to poverty measurement using non-income indicators.

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

Thus many non-income measures of wellbeing 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 indicates 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 counter-arguments 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 many people in many developing countries are chronically deprived of critical functionings. For example, adults (many of whom are female) in developing countries who never had the opportunity to be schooled will be chronically educational poor. This might be an obvious statement, but from a wellbeing perspective we occasionally need to be reminded that attempts to achieve universal enrolment 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 wellbeing achievements do not adequately reflect the functioning in question. For example, adult height is indicative only of the nutritional status during childhood, but not in the current period. Furthermore, the number of school years gives no indication of the level of an individual's functional education at a point in time. To track this, different measures are needed, such as test scores and functional literacy and numeracy surveys that exist only in some countries (e.g. OECD 2000). These scores are likely to fluctuate more over time and can go up or down for adults.

Third, despite the fact that a wellbeing indicator for an *individual* does not necessary change over time, it may at times be useful to consider a *household* perspective. For example, while education in itself is clearly valuable to an individual, there can also be benefit from the education of other household members. If this is the case, it might be useful to consider the average education of household members or possibly even the highest education level within the household (see Basu and Forster 1998). These indicators will clearly fluctuate more over time than the educational level of the individual.

Fourth, on the part of some indicators there is considerable movement for children, but little (or no) movement among adults (e.g. years of schooling). Consequently there might be some advantage to tracking changes in non-income poverty separately for children and adults; this could generate different insights. Lastly, we show in Section 4 that there is a range of indicators where there is quite a lot of dynamics over time so that there is indeed empirical justification to examine chronic (and transitory) poverty in a non-income perspective.

The second drawback is that current survey instruments lack the tools to systematically track poverty in the non-income dimension. This is clearly a valid point, as many surveys do not systematically track, for example, the health or nutrition status of all individuals across time with comparable measures. In the survey used here, there are also shortcomings in this respect. But this should simply lead to new efforts to improve survey design rather than abandon this interesting approach.

The third objection is the difficulty in interpreting the linkages between income and non-income poverty dynamics for two reasons. One is the differing magnitude of measurement error in the two dimensions. This could make it difficult to interpret differences in chronic income versus 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.<sup>6</sup> The second interpretation problem deals with the fact that the income indicator will always refer to households, whose size and composition may change over time, thereby affecting its poverty status. In contrast, the non-income assessment of poverty will usually focus on individuals who are present in both periods. Indeed, while this difference has to be borne in mind when household chronic poverty is compared with individual non-income chronic poverty, one can just as easily use existing household boundaries to calculate non-income household poverty (as we do below).

The last objection is that in measuring non-income poverty dynamics, several new conceptual questions arise. For example, what is education and health poverty among children? How does one define such poverty as being chronic or persistent? Is an individual education poor only if he/she is not in school? Or is the individual also education poor if he/she is lagging behind in progressing through school? Or what if his performance is deteriorating? When does an individual 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 the issue only persistent stunting? Clearly these are serious questions and we explore below the empirical impact of some of the answers relating to these difficult issues. But here, too, there is need for more work in extending the concept of chronic poverty to these issues rather than abandon the effort.

Thus we believe that studying chronic non-income poverty is well warranted, and the approach taken here is to simply explore whether, given the 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 on the static and dynamic aspects of wellbeing.

### **3. Methodology**

#### **3.1 Measurement of chronic poverty**

Two methods have been proposed for measuring chronic poverty: the ‘spells’ approach (McKay and Lawson 2003) and the ‘component’ approach (Jalan and Ravallion 1996). The ‘spells’ approach defines households as chronically poor if they have always been poor, i.e. whose per capita household consumption has been below the poverty-line in all observed timepoints. The transient poor are those who have been poor only temporarily. In contrast, the ‘component’ approach distinguishes a household’s permanent (average) consumption from temporary variations in 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 household poverty so that classification of households into chronic and transient poor households is not possible.

In this study we select the ‘spells’ approach because we have only a two wave panel available. 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 the whether observed transient poverty is caused by fluctuating welfare indicators or whether it is caused by individuals falling into – or escaping from – poverty, i.e. we cannot determine if the changes observed in the wellbeing of individuals are stochastic or structural.

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

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<sup>6</sup> 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, in line with the literature on chronic income poverty, we treat poverty in the income and non-income dimensions as a dichotomous yes/no question and thus will not consider its depth or severity.<sup>7</sup> In addition, as non-income poverty for adults and children is often defined and measured differently in a theoretical as well as a measurement perspective, and should thus show different dynamics, we analyse poverty dynamics for these two subgroups of the population separately.

### **3.2 Indicators of non-income poverty**

The question arises as to which non-income indicators should be analysed. For a theoretical discussion of temporary and long-term wellbeing, an analysis of a very broad range of functionings might be appropriate, but it could be more useful to focus on a smaller subset of basic functionings for empirical studies. We therefore focus on education and health (approximated with the nutritional status of individuals)<sup>8</sup>, since these are probably among the most critical and commonly agreed capabilities (Hulme and McKay 2005). These non-income indicators have the additional advantage of being measured at the individual level in contrast to housing or service access, for example, which, similarly to income, can only assess chronic poverty of households.

For children below the age of 18 years we use stunting as an indicator of health or nutritional deprivation whereas for adults 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 common US-based reference standard recommended since 1987 by the World Health Organization (WHO) for monitoring undernutrition everywhere (see Klasen 2007b for further details).

While most analysts agree that the z-score is particularly accurate in measuring nutrition problems of children under 6 years, there are questions with regard to its applicability to populations outside the US for older children, as growth after the age of 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 others might be misclassified as well-nourished even though they are undernourished but this does not show up in their height due to 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 is thus chosen instead as the measurement of undernutrition. The BMI is defined as the weight in kg divided by the height squared in meters of individuals. While a low BMI is certainly an indicator of

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<sup>7</sup> Clearly, considering the 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.

<sup>8</sup> In an earlier version, we also considered a morbidity indicator, but this measure only captured very recent illnesses and not the 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 the inclusion of more detailed health questions in household surveys. See Schultz (2002, 2003) for a discussion of particularly useful health indicators.

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 of the 'health' poor may not be captured with this indicator.<sup>9</sup>

Moderate (severe) education poverty for adults of 16+ years is defined as having less than 9 (4) years of education. Moderate education poverty for children aged 6-15 years is defined as having dropped out of school within the first 9 (4) years. 'Four years' of education refers to completed primary school, 'nine years' refers to completed lower secondary school. In addition, we consider children who were in school in one observation period but not in the other observation period as transient poor. Also children who were in school in both observation years  $n$  and  $n+t$ , but who failed to complete  $t$  years of schooling during the observation period are considered transient poor.

Clearly, while the choice of the schooling variable seems justified for adults, it is somewhat arbitrary for children. One could have just as well considered only the children who were not in school in the two observation periods as educational poor, but could also have included all children lagging behind in their school programme in comparison to their age (in either period). This would include children who are already lagging behind in the first observation period as well as those who fall behind during the observation period, i.e. children whose progress is slower than the number of years between the two waves would imply. These problems could be circumvented by using educational test scores, but hardly any household survey, let alone panel survey, collects such data on a regular basis.

Examining several non-income indicators—inevitable in studying wellbeing from a functioning/capability perspective—brings up the question of an appropriate aggregation and weighting, particularly if the objective is to generate summary measures of wellbeing (e.g. Atkinson and Bourguignon 2000; Ramos and Silber 2005). Alternatively, one can simply report the individual functionings/capabilities without weighting and aggregating them, thus generating partial orderings of wellbeing outcomes.

In this study, we choose the latter approach and do 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, using our indicators, education poverty is largely irreversible because adulthood has already been reached, while nutrition poverty can be reversed as general conditions improve. Moreover, in analysing multidimensional poverty in a dynamic perspective, the issue is not only the aggregation and weighting of different non-income indicators, but also the method for achieving this over time.<sup>10</sup>

### 3.3 Research questions

Applying the described non-income indicators to study chronic underdevelopment, we first examine if and to what extent income and non-income indicators exhibit 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 investigates from a macro-perspective whether the same share of individuals suffer from chronic income and non-income poverty whereas the latter approach takes a micro-

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<sup>9</sup> See for example, Henderson (2005) for a discussion.

<sup>10</sup> 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).

perspective to analysis if the same individuals can be identified as chronically poor, regardless of whether income or non-income indicators are used.

In the second phase, 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 examines the persistence of poverty of different generations within the same household. Such an analysis of individual chronic poverty usually is not possible with income indicators.

### **3.4 Data**

Our data come from the Vietnam Living Standard Survey (VLSS), which is a two wave panel conducted in 1992/93 and 1997/98. The first round comprises a sample of 4,799 (23,838) and the second round 5,999 (28,509) households (individuals). Of these, 4,305 households were interviewed in both years, allowing us to track 17,829 individuals over a 5-year period. As we limit our analysis to households and individuals that were present in both years, attrition bias may be a problem, in the sense that these households and individuals are not a full representation of 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 less than 5 years of age in 1997 are excluded as they had not yet been born in 1992. For a comparison with non-income poverty dynamics, we also calculate income poverty dynamics. We define moderate poverty as household consumption per capita below the official poverty line and severe poverty as household consumption per capita below the official food poverty line. The official (food) poverty line, set 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.<sup>11</sup>

## **4. Empirical results**

### **4.1 Level 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 focus on adults or children) we come to quite different conclusions about poverty dynamics and the level of chronic poverty in Vietnam.

However, in general one can state that nutritional, and particularly educational, wellbeing (with a transient poverty component of 25.8 percent and 15.0 percent, respectively) fluctuates less than income poverty (transient poverty component of 33.0 percent). Also, the wellbeing of adults seems to be much more stable than that of children. Whether stable wellbeing is positive or negative from a normative perspective depends on whether an individual is poor or non-poor in a certain wellbeing dimension. For the poor, steady indicators mean poverty traps, for the non-poor steady indicators mean higher permanent wellbeing. But there is a significant transient component for all human development indicators (except education for adults), i.e. thus studying the dynamics of non-income dimensions of wellbeing is justified.

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<sup>11</sup> We thus do not apply equivalence scales. White and Masset (2003) recently show the 'bias' induced when the household size and composition are ignored in poverty profiles for Vietnam in a static context. In a further study it would be interesting to analyse 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.

**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 remarks have to be made regarding the interpretation of poverty dynamics across different wellbeing dimensions. The first issue relates to the fact that we often only have a two wave panel, within which high transient income poverty could be caused largely by general economic development. In our case, Vietnam experienced significant economic growth which led to a massive decrease in income poverty between 1992/3 and 1997/8 (see also Bonschab and Klump 2007), with the headcount poverty rate falling from about 61 percent to 34 percent. All measures of non-income poverty show much smaller improvements.

In this economic boom environment it is difficult to distinguish with a two wave panel whether the high income poverty dynamics are caused by income fluctuations or by a shift out of structural poverty by a large part of the population. Likewise, we do not know if we are observing higher chronic non-income poverty because human development indicators are more stable (i.e. are less volatile) or because they adjust slower to economic development (i.e. with some delay) than income indicators. Then, the interesting question here is whether the 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, without a doubt, are 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 simply stem 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 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. In doing so, the share of transitory income poverty remains about the same and is much higher than the share of transitory nutrition poverty, while the share of the 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, the differences between income and non-income chronic and transitory poor largely disappear; thus much of the transitory component of income poverty is indeed related to a quicker escape from income than non-income poverty during that boom era in Vietnam. However, if we adjust income poverty rates to education poverty rates in both years, the transient component of income poverty is still much higher than the transient component of educational poverty, indicating that educational wellbeing is indeed much more stable over time than income poverty (or 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	<u>43.2</u>	<u>43.2</u>	<u>43.2</u>	<u>58.1</u>	<u>58.1</u>	<u>58.1</u>
Poor 1997	34.2	<u>34.5</u>	17.0	<u>34.5</u>	<u>49.7</u>	30.8	<u>49.7</u>
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 align 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 the nutritional (educational) poverty.

Two further measurement issues might explain the higher transient component in income poverty dynamics: household dynamics and measurement error. As stated above, in calculating per capita income, we consider the total household and thus income poverty while for our non-income analysis we only consider individuals present in both surveys. Although they do not directly affect the non-income wellbeing of the individuals tracked (see discussion in 4.3), household dynamics, i.e. increasing or decreasing households size, will have a significant impact on per capita income and thus affect poverty dynamics (by affecting the denominator used to divide existing household incomes or by affecting the numerator if additional individuals contribute income). With regard to measurement error, income (or consumption) is likely to be measured with higher measurement error than non-income indicators, thus a considerable part of transient income poverty could be caused by measurement error. 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). Nevertheless, Bhatta and Sharma (2006) apply Luttmer's (2002) method of error-adjusted consumption measures to a two wave panel in Nepal. This deserves further consideration, although some rather stringent assumptions would have to be made.

#### 4.2 Correlation of chronic poverty

Even if national levels of income and non-income poverty were the same at a point in time or across time, it is still possible that income chronic (transient) poor are different from the non-income chronic (transient) poor. That is to say, depending on the measures used, we might identify different households (individuals) as chronically poor. This has important relevance from a policy perspective, as it would affect the targeting of anti-poverty policies.<sup>12</sup>

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 who are also non-income chronic (transient, non-) poor, i.e. each row sums up to 100 percent.<sup>13</sup>

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

<sup>12</sup> See Klasen (2000) for a discussion in a static context.

<sup>13</sup> Alternatively, one could have calculated the percentage of the non-income chronic (transient, non-) poor who are also income chronic (transient, non-) poor. As we obtained the same conclusions with this latter approach, we only report the former.

poor in a nutrition and education perspective or vice versa.<sup>14</sup> For example, 39.0 percent of the chronic income poor are never nutritionally poor. The correlation is even lower for transient poverty. For example the likelihood of being nutritionally transient poor does not increase (or increase by much) if the individual is transient income poor. In both the chronic income poor and the transient income poor, 27.5 percent are also nutritionally transient poor.

Again, one could argue that part of the weak correlation between income and non-income indicators is a consequence of general deviations 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 (results not given here). This low correlation between the income and non-income poverty dynamics even with the fitted income poverty rates could then be explained by two other major factors. Either there is already a low correlation between the different static poverty dimensions (Table 4) or different dimensions of wellbeing exhibit very different dynamics (see Table 5). We explore these in turn.

Table 4 presents the static correlation between income and non-income poverty in 1992 and 1997. Each year and each human development dimension sums up to 100 percent. As can be observed, the income poor are not necessarily the non-income poor. For example in 1992, 29.9 percent of the population is both income and nutrition poor, whereas 25.3 percent is neither income nor nutrition poor. However, 44.9 percent of the population is either income poor but not nutritional poor, or nutritional poor but not income poor. In 1997, due to

**Table 3 Correlation of income and non-income dynamics**

Income	Nutrition			Education		
	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

**Table 4 Correlation of static income and non-income poverty**

Income 1992	Nutrition 1992		Education 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
Income 1997	Nutrition 1997		Education 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

<sup>14</sup> See Baulch and Massett (2003) for a similar finding.

**Table 5 Correlation of income and non-income dynamics**

Income	Nutrition			Education		
	Chronic	Transient	Non-poor	Chronic	Transient	Non-poor
Chronic poor	65.3	34.7	<u>0.0</u>	87.9	12.1	<u>0.0</u>
Transient	52.9	38.2	8.9	80.9	15.0	4.1
Non-poor	<u>0.0</u>	11.4	88.6	<u>0.0</u>	12.1	87.9

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

Vietnam's significant economic development in the 1990s, the share of the poor in both dimensions decreased whereas the share of the non-poor in both dimensions increased significantly. Still, 40.0 percent of the population is poor in one dimension but not in the other. The same trends can be observed if we analyse educational poverty instead. Thus the extent of differences in static poverty is very large, in fact larger than in some other studies where income poverty is compared with composite non-income measures of wellbeing (e.g. Klasen 2000).<sup>15</sup>

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

If we analyse the 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. In particular, the income non-poor also seem to stay non-poor in the non-income dimension: approximately 80 percent of the income non-poor also maintain that status in other wellbeing dimensions. Also the chronic income poor remain, to a large extent, (chronically) poor in non-income dimensions. In contrast the transient income poor, i.e. mostly those individuals who move out of poverty, often remain chronically poor in other dimensions. This could be caused by delayed dynamics, where non-income indicators change *after* income wellbeing 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 Intrahousehold poverty dynamics

As discussed above, a particular advantage of examining non-income dimensions of wellbeing is the ability to study intrahousehold differences in wellbeing levels and trends. In this section we explore household non-income poverty dynamics, i.e. analyse the difference

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<sup>15</sup> As discussed above, a part of this difference is related to the 'noise' in the anthropometric indicator that gives only a probabilistic assessment of a true nutritional deficit of an individual.

between (aggregate) household and individual non-income poverty dynamics, which cannot be captured by income or consumption measures of poverty dynamics, as these always assume that either everyone or no one in a household is income poor. Differences in household and individual poverty dynamics, as already discussed above, could 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 intrahousehold 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 exercise caution with regard to the total population and should instead analyse adults and children separately, as considerable variation in poverty dynamics between adults and children is caused by differences in measurement (e.g. the nutritional status of adults is measured as weight over height, whereas the nutritional status of children is measured as height over age).

**Table 6 Household non-income poverty dynamics**

	Nutrition			Education		
	Total	Adult	Child	Total	Adult	Child
<b>Homogenous non-income poverty dynamics</b>						
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
<b>Heterogeneous non-income dynamics</b>						
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 <sup>a)</sup>	Household <sup>b)</sup>	Individual <sup>a)</sup>	Household <sup>b)</sup>
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: <sup>a)</sup> Poverty rates refer to the individual BMI and years of schooling for adults 18+.

<sup>b)</sup> Poverty rates refer to per capita average household BMI and schooling. Rates only for adults of age 18+.

Whether we look at nutrition or education, only about 40-60 percent of individuals live in households where all adult or child members exhibit the same poverty dynamics. What is most surprising is that up to 1/3 of individuals 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 a part of the low correlation of income and non-income poverty dynamics at both the micro-level (Section 4.2) and at 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 the *household* average nutritional (and educational) poverty rates per capita. If we use the household average instead of individual rates, the transient poverty rate (relative to the chronic share) becomes significantly larger. So a 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) wellbeing indicators. If one individual improves his/her welfare, then all other household members 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 using household rates, the chronic component of the nutritional poverty rate decreases in comparison to individual rates, whereas chronic poverty in the educational poverty rate would significantly increase.

Lastly, non-income wellbeing indicators, or intrahousehold poverty dynamics can also be used to analyse long-term (intergenerational) poverty dynamics. This usually is 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 wellbeing of two generations within the same household. Table 8 shows nutritional and educational poverty for all households, where at least two generations were present.<sup>16</sup> ‘Poor elderly’ indicates the poverty rate of individuals of the older generation, whereas ‘poor young’ refers to the poverty rate of second-generation individuals. ‘Poor’ refers to individuals who are living in households where both generations are poor, i.e. where intergenerational chronic poverty persists. By definition, all generations within the same household are either income poor or not poor. However, quite a significant share of individuals live in households where one generation is non-income poor but the other is not. This is particularly true with regard to educational poverty which is passed from one generation to the next, and we should be very concerned about these households where poverty persists over a 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 1997 cross-section data. However, we obtain the same trends if we use the 1992 data instead.

<sup>16</sup> Poverty rates were calculated based on average consumption, BMI and educational level of adults older than 18 years belonging to one of the two generations within households.

## 5. Conclusion and further research

The main findings from this exploratory analysis on the study of chronic poverty and/or poverty dynamics from a non-income perspective are first, that there are sound reasons, both theoretical and empirical, to argue in favour of moving in this direction. Such an analysis could generate important new insights into the dynamics of wellbeing outcomes over time, their relationship to incomes, and intrahousehold and intergenerational dynamics. 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 caused to a great extent by the low static correlation between the two than by different dynamics over the observed period. Last, we observed a rather high heterogeneity in intrahousehold non-income poverty dynamics, which would not be captured by income poverty measures.

Given the limitations of our data, these are interesting findings that warrant further exploration. But clearly one major implication of our research is that more effort must be directed into generating comparable panel datasets that fully capture important non-income wellbeing outcomes. 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 and these should be considered for further research. Most important is a formal regression-based analysis of the determinants of income and non-income poverty dynamics to develop a better understanding of the surprisingly low correlation between the two as well as the high heterogeneity of poverty dynamics within households. To date, most related regressions have examined only the determinants of chronic and transient income poverty where some non-income dimensions of wellbeing (particularly human assets such as health and education) are seen to be important determinants (e.g. Woolard and Klasen 2005). Such regression approaches could also be extended to explain dynamics of non-income poverty. Controlling for measurement error and endogeneity will clearly be an issue here, which can be more easily resolved if one can use lagged values as instruments in panels with more than two waves. Such analyses could usefully consider actual income and non-income deprivation levels rather than be based on dichotomous poverty definitions, as was used here in our exploratory analysis.

Moreover, one can more systematically examine whether some households are chronically worse at converting 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 as chronically poor which are chronically underperforming in turning incomes into functionings. These households as well as those identified as multidimensionally poor in a dynamic perspective are the ones most urgently in need of support.

Second, 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, particularly in the comparison of income to non-income poverty dynamics.

Third, one can examine the whole *distribution* of income and non-income wellbeing 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; Klasen 2005) in combination with the work of Grimm (2006) could

be extended to study non-income poverty dynamics across the entire wellbeing distribution of households.

A fourth interesting extension of our work would be to derive multidimensional measures of non-income poverty dynamics that go beyond a partial ordering of wellbeing outcomes. The challenging question here is not only how to weight and aggregate different wellbeing dimensions but in addition how to weight and aggregate different time dimensions. Such work could build on the 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 these researchers, social exclusion is the (weighted) sum of individual functionings from which an individual is excluded over time. The paper is very 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 work done by Duclos, Sahn and Younger (2006) with that by Gräb and Grimm (2006), as the former concentrates on robust multidimensional and the latter on robust multi-period poverty comparisons in non-income dimensions.

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