

Multidimensional Poverty Monitoring: Methodology and Implementation in Vietnam

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Abstract

The paper presents three outputs:

- A relevant and significant multidimensional poverty profile of Vietnam, static and dynamic (1993, 1998 and 2002), including a composite poverty indicator;
- An assessment of the analytical capacity of the MIMAP methodology developed in Vietnam, by a comparison with the standard income poverty analysis; and
- Some recommendations to improve the methodology of identifying who are the poor in Vietnam, as a tool for better designed and targeted poverty alleviation policies.

In this study, eight simple non-monetary, categorical indicators of human and physical assets developed in CBMS research in Vietnam, have been identified in the Vietnam Living Standards Surveys and two CBMS data sets. They have been analyzed and aggregated in a composite indicator using the factorial technique.

The comparison of this multidimensional approach to poverty measurement with the moneymetric one based on total household expenditures shows that the CBMS type of indicators presents a strong analytical potential for multidimensional poverty analysis, being complementary to the more standard moneymetric analysis. In addition, due to their ease of use and low cost, they should be

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considered in meeting the objective of regularly producing largely disaggregated poverty profiles for a more efficient monitoring of poverty reduction policies and programs. They could also suggest some simple questions to be integrated in national censuses for the purpose of mapping poverty at the lowest level with a national coverage.

Introduction

Since its introduction twenty-five years ago, moneymetric analysis of poverty has achieved a lot. Methodologies have been developed to better describe the difficult situation of marginalized families within communities in terms of general level of welfare and to better tackle the problems they are facing. This pioneering work on poverty has led to the evolution of the concept of poverty a multidimensional view.

This has, however, raises new technical challenges: How does one measure poverty now? By multiple indicators? How do we define the relevant indicators? How do these multiple measurements are weighed to get a composite (integrated) measurement of family welfare in order to identify the poorest?

In addition to this conceptual extension, an operational issue has also become critical: the limitations in the analytical power of standard household surveys designed to measure standard of living such as monetary poverty. Can we capture the multidimensional face of poverty through a small set of reliable indicators that are light and easy to measure?

Policymakers ask for reliable poverty measurements with a very high level of disaggregation in terms of well geography socioeconomic groups, and with regularity in their update. Unfortunately, developing countries cannot meet these policy requirements given the high costs of conducting standard household surveys.

So, what is a possible solution? Is there an alternative? These are the issues addressed by several national groups of researchers, including a Vietnamese group working under the umbrella of the

Micro Impacts of Macroeconomic Adjustment Policies (MIMAP)¹ Network supported by the International Development Research Center of Canada (IDRC) for the past 15 years.

One of the key objectives of the research work being done by the Vietnamese group since 1998 is to describe multidimensional poverty in Vietnam² and its change across time, with a specific tool developed. This tool consists of two parts:

- a) A small set of light household poverty indicators identified through community-based surveys; and
- b) A methodology to build a composite indicator.

In this regard, this paper aims to produce three outputs:

- A relevant and significant multidimensional poverty profile of Vietnam, static and dynamic (1993 and 1998)³, including a composite poverty indicator;
- An assessment of the analytical capacity of the MIMAP methodology developed in Vietnam through a comparison with the standard income poverty analysis; and
- Some recommendations to improve the methodology of identifying who the poor are in Vietnam, as a tool for better designed and targeted poverty alleviation policies.

The policies, however, will not be dealt with extensively in this paper.

¹ A large part of the program is now implemented through the Community-Based Monitoring System (CBMS) Network under the Poverty and Economic Policy (PEP) Research Network.

² From hereon, the word "poverty", without any qualifier, will implicitly mean "multidimensional poverty", and there will eventually be a qualification like "income (monetary) poverty", "health poverty", among others.

³ These two years are determined by the availability of nationally representative data sets. The methodology developed here will obviously be applied to subsequent years (e.g., 2002) as soon as data sets are available.

Methodology

Steps of analysis

The analysis goes through the following steps.

1. Identification of a set of poverty indicators from among the community-based surveys in Vietnam whose equivalent can be extracted from large scale national surveys.⁴
2. Construction of the MIMAP indicators from the large database provided by each of the two national surveys.
3. Estimation of a national multidimensional poverty profile for 1993 and 1998. These profiles will be accompanied by precision estimates and significance tests integrating the complex survey designs probabilistic structures. Results will be compared with the analysis of income poverty as published in official reports on VLSS-1993 and VLSS-1998.
4. Refinement of the analysis by building a composite poverty indicator integrating the set of MIMAP indicators, and, on the basis of this unique indicator, development of a static and dynamic poverty analysis compared to the moneymetric analysis.
5. Application of the composite indicator to the MIMAP 1999 survey data, to get an aggregated poverty profile from this survey.

⁴ Essentially, a MIMAP survey conducted in year 1999 in four provinces, twenty communes and 22,770 households was considered. All households have been surveyed in each selected commune, which explains the large sample size. Indicators are taken from the one-page questionnaire used in this survey. (This survey is described in Vu Tuan Anh (2000), *Poverty Monitoring in Vietnam*, Annual MIMAP meeting held in Palawan, Philippines, Sept. 2000. IDRC, Ottawa, mimeo). One additional indicator—sanitation—is identified in an extended MIMAP questionnaire used in the baseline survey of a poverty alleviation project implemented in the province of Thanh Hoa province.

Two large scale national household surveys are used to assess the relevance of these MIMAP indicators: the Vietnam Living Standard Survey conducted in 1993 (VLSS-1), with a nationally representative sample of 4800 households, and the similar VNLSS-2 survey conducted in 1998, with a sample of 6002 households.

The final activity based on the results of the analysis is the development of proposals for improving the poverty measurement methodology in Vietnam.

Set of indicators

Based on a comparative analysis of our community-based poverty monitoring survey (CBMS) and VLSS questionnaires, it has been possible to identify a small set of eight indicators, for which equivalent indicators can be extracted from the large VLSS databases, as described in Table 1.

Table 1. The set of eight CBMS indicators

Indicator No.	Title	Description
#1	Underemployment	A worker is considered as underemployed if he is missing job for 3 months or more in the previous year. At the household level, at least one main worker is underemployed.
#2	Chronic sickness	For a person, to be sick for at least one month a year. At the household level, at least one household member is chronic sick.
#3	Adult illiteracy	An illiterate person aged 15 years old and above who cannot read, write and do simple calculations. At the household level, at least one adult member is illiterate.
#4	Underschooling	A child aged 6-15 years old not attending school. At the household level, at least one child is not going to school.
#5	Without radio, TV	There is no radio nor TV set owned by the household.
#6	Type of dwelling	Category of house.
#7	Drinking water	Type of main source for drinking water.
#8	Sanitation	Type of toilet used by the household.

Due to the extremely different questionnaires used in the community-based poverty surveys vis-à-vis the VLSS, adaptations in terms of extraction from the VLSS of an acceptable proxy have been required for some indicators.

For example:

- For underemployment: due to the complexity of the employment section in the VLSS and the differences in the 1993 and 1998 questionnaires, many questions have been required to approximate the CBMS definition.
- Chronic sickness: considered are persons having been sick for at least 15 days in the last 4 weeks.
- For adult illiteracy: due to the lack of detail in the CBMS questionnaire, and to the different questionnaires for the 1993 and 1998 VLSS, three capacities, "read", "write" and "calculate" were retained. The requirement is higher than in many standard studies. On the other hand, it could be closer to the expected results of functional literacy programs.
- For underschooling: the range of 6-15 years old includes the end of the upper secondary level.
- And for indicators #5 to #8, the treatment was easier.

These indicators may be classified as individual characteristics (indicators #1 to #4) and household characteristics (indicators #5 to #8). The individual indicators are, however, transformed into household level indicators essentially because this is the case in the standard one-page CBMS questionnaire where there is no household member roster. Thus, all eight indicators are computed at the household level but they convey a multidimensional concept of poverty.

These eight indicators may also be distinguished according to their association with some areas of basic needs: income (#1 underemployment and #6 type of dwelling), education (#3 adult illiteracy, #4 underschooling and #5 without radio, TV) and health (#2 chronic sickness, #7 drinking water and #8 sanitation). From this

angle, the eight indicators can be seen as reflecting three basic human capabilities: (1) capability to generate income; (2) capability to access learning and communicate; and (3) capability to live a healthy and long life. If the income dimension reflected in #6 (type of dwelling), #5 (radio/TV), #8 (sanitation) are carefully looked at, it can be seen that it is more the investment component of income, rather than the consumption component, which is found in the set of indicators.

To summarize, the eight indicators present a concept of human (#1 to #4) and physical (#5 to #8) assets of household poverty. Thus, the different facets of poverty have been integrated in the multidimensional measurement.

Measurement of multidimensional poverty

A multidimensional poverty profile for the base-year 1993

To have a better understanding and analysis of the distribution of poverty in Vietnam, a disaggregated profile of poverty based on the specific distribution of each indicator was made, followed by the computation of a composite indicator.

The disaggregations were made in accordance with:

a) geographical location

- rural/urban;
- seven regions: Northern Uplands (1), Red River Delta (2), North Central (3), Central Coast (4), Central Highlands (5), South East (6), and Mekong River Delta (7);
- North (regions 1 and 2), Center (regions 3, 4 and 5), and South (regions 6 and 7).

b) social characteristics

- ethnicity (Kinh, minorities)
- household size
- gender of household head
- main activity (farm and non-farm)

c) moneymetric poverty

- relative income poverty: relatively poor households are those below half the median income per capita; and
- expenditure quintile.

On the basis of the sampling weights determined by the sample design, two estimators are provided in each household category coming out of cross-classifying the eight indicators with the nine disaggregation factors, which gives 72 two-way tables. The two indicators are the total number and the percentage of households in each category. The total number of households is not usually presented in other poverty profiles but the survey considers it important to view the population size of different types of poverty (targeting, program costs, etc.) as well as to integrate the population dynamics into the poverty dynamics analysis. A significance test was run for the distribution differences in each of the 72 two-way tables.⁵

The profile with eight CBMS indicators

Table 2 presents the poverty status in 1993 based on the distribution of the eight indicators. The major forms of poverty faced by the Vietnamese households at that time were the lack of communication facilities (53%), dwelling infrastructure with 36.5 percent living in temporary house, not having a toilet 47.5% , underemployment (44%) and adult functional illiteracy (37.5%). Unsafe water (19.3%), chronic sickness (18.1%) and underschooling (15.1%) are less critical problems. Income (economic) poverty appears more acute than social poverty.

What is more interesting, though, is how this poverty is distributed across household, geographic and socioeconomic groups.

⁵ The statistic then follows a *F*-distribution. See Rao J.N.K. and Scott A.J., *On chi-squared tests for multiway contingency tables with cell proportions estimated from survey data*, The Annals of Statistics, 1984, Vol. 12, No.1, 46-60. The test was implemented using Stata.

Chronic sickness alone accounts for 6 of the 11 non-significant cases.

Geographically, all types and forms of poverty, except chronic sickness, are more acute in rural than in urban area. The level of sickness is the same in both areas. Regionally, from North to South, there are significant differences in all types and forms of poverty,

Table 2. Multidimensional poverty in 1993

Indicator		%	Confidence interval 95%	Design effect
Underemployment	Underemployment	56.0	2.8	2.0
	No underemployment	44.0	2.8	2.0
Chronic sickness	No chronic sick	81.9	1.7	1.5
	With chronic sick	18.1	1.7	1.5
Adult illiteracy	Adults literate	62.5	2.5	1.8
	Adults illiterate	37.5	2.5	1.8
Underschooling	Children going to school	84.9	1.4	1.4
	Children not going to school	15.1	1.4	1.4
Without radio, TV	Without radio, TV	53.0	2.4	1.7
	With radio, TV	47.0	2.4	1.7
Type of dwelling	Permanent house	16.5	2.8	2.7
	Semi-permanent house	47.0	3.8	2.5
	Temporary house	36.5	3.6	2.6
Drinking water	Piped, rain, drilled well	26.2	4.0	3.3
	Dug well	52.7	4.6	3.2
	Pond, lake, river	19.3	4.2	3.8
	Others	1.8	1.5	4.0
Sanitation (Types of toilet used)	Flush toilet	10.4	1.8	2.1
	Double vault compost latrine	8.4	1.9	2.4
	Simple toilet	33.8	3.4	2.6
	Other types	20.8	3.2	2.8
	No toilet	26.6	3.7	2.9
TOTAL	14,104,261 households	100.0		

except for underemployment. All other forms of poverty dominate in the South, except chronic sickness which is more acute in the Center. If regional analysis is refined within the North-Center-South main division, all eight indicators are shown to be significantly distributed. In the North, education and health poverty as well as temporary housing, are stronger in the Northern Mountains than in the Red River Delta. On the other hand, underemployment largely dominates in the Red River Delta where it reaches the highest rate (53.5%) in the country due to high population density while the lowest rate is observed in the Northern Uplands. In the South, all types and forms of poverty are more acute in the Mekong River Delta than in the Southeast region. In fact, four of the eight poverty indicators have the country's highest value in the Mekong River Delta.

Socially, the ethnic minority groups are less literate and have lower quality dwelling and sanitation facilities than the Kinh. On the other hand, the Kinh are more underemployed. Female-headed households are better-off relative to underemployment, schooling, safe water and sanitation while male-headed households are better-off in terms of literacy and communication means. Except for chronic sickness where they do not differ, farming households are significantly poorer than non-farming ones in all other forms of poverty. Large household size means more individual poverty according to the nature of the indicators but they are better equipped in terms of communication means while their sanitation facilities seem to be less satisfactory.

Economically, income poverty is directly associated with illiteracy, no communication facilities, temporary housing, unsafe water and bad sanitation facilities. Relative income poverty does not affect children schooling significantly but there is a significant drop in underschooling for the richest households. The same is observed regarding underemployment: it drops significantly only for the richest. Income poverty has no significant effect on chronic sickness.

From this analysis of multidimensional poverty as represented in the eight indicators, it is seen that it is difficult to draw a clear view

of the socioeconomic distribution of poverty without an aggregate measure of the human and physical asset poverty. To this end, a composite indicator is needed.

The profile with a composite indicator and comparative analysis with the moneymetric approach

To build a composite indicator from the eight previously mentioned indicators to describe multidimensional poverty, a factorial analysis technique is used, more precisely, the multiple correspondence analysis (MCA) is used where all eight indicators are consistent with the first factorial axis and where the household score on this axis is taken as the composite poverty indicator. A translation using the average of the minimal category negative weights is used to make the poverty indicator positive. This equivalent to giving a zero weight to the minimal category of each primary indicator.⁶ The category weights obtained from this technique are presented in Table 3. The composite poverty score of any household is then given by its average weight over the eight primary indicators.

The 8 indicators and their 21 categories theoretically allow a possibility of 1536 different individual household poverty profiles, or poverty groups. With the sample of 4800 households in VLSS-1993, there are in fact 699 different poverty groups or 7 households/group on average.

Multidimensional welfare level comparisons

The first composite poverty analysis consists of comparing the mean of the composite indicator across the different socioeconomic groups earlier analyzed as shown in Table 4. In addition, the mean expenditure per capita is also given to check if both concepts of poverty lead to the same analytical results. Since a higher value of the composite poverty indicator means a higher welfare level, Table 4 compares the welfare level across different socioeconomic groups.

⁶ See Asselin (2002).

Table 3. Category weights according to Multiple Correspondence Analysis

Indicator	Category	Weight	Poverty Threshold
Underemployment	Underemployment	0	←
	No underemployment	575	
Households with chronic sick 15 days	With chronic sick	0	←
	No chronic sick	626	
Households with adult illiteracy	Adults illiterate	0	←
	Adults literate	1544	
Households with children aged 6-15 years old not schooling	Children not going to school	0	←
	Children going to school	1059	
Households without radio, TV	Without radio, TV	0	←
	With radio, TV	1988	
Type of dwelling	Temporary house	0	←
	Semi-permanent house	1845	
	Permanent house	4302	
Drinking water	Pond, lake, river	0	←
	Other water sources	348	
	Dug well	1534	
	Piped, rain, drilled well	3667	
Sanitation (Types of toilet used)	No toilet, other types	0	←
	Simple toilet	1315	
	Double vault compost latrine	2559	
	Flush toilet	5098	

The composite indicator can be seen as the mean of two sub-indicators, the first one related to human assets as represented in the first four indicators (employment, sickness, literacy, and schooling), and the second, to physical assets (radio/tv, dwelling, drinking water, and toilet).

Geographically, Table 4 reveals among others that urban areas are always better-off in terms of assets and consumption welfare.

The dominance of the Southeast region, with Ho Chi Minh City, is much less striking in assets than in consumption welfare. The Red River Delta, with Hanoi, and even the North Central are equivalent to the Southeast in terms of human assets. On the other hand, the Mekong River Delta, ranking second in consumption welfare, is the poorest region in terms of assets (both human and physical assets). Inversely, the Northern Mountains, the poorest region in terms of consumption, ranks fourth and just over the average in terms of assets welfare.

Globally, if the urban and rural parts in the North and South, are combined, the striking difference seen between the moneymetric and multidimensional analysis is that the North is significantly better-off than the South and Central regions in terms of assets welfare while the South is significantly better-off in terms of consumption welfare.

Socially, the Kinh dominates the minorities in both types of welfare. A closer look using the F-statistic⁷ shows though that the most significant difference between both groups is in terms of the human assets indicator. In terms of gender, while the female-headed households significantly dominate the male-headed ones in consumption welfare, the gap disappears in terms of assets welfare, especially for human assets. Non-farming households are better-off than farming households in both types of welfare.

Economically, the last three rows in Table 4 show that there is a positive correlation between assets and consumption welfare. In fact, the correlation between the composite poverty indicator and the per capita expenditure takes the value 0.49.

Multidimensional poverty and inequality analysis

Two poverty lines have been defined for the composite poverty indicator. The first one, which could be qualified as a *relative* poverty line, is defined from the moneymetric poverty rate officially established for the VLSS-1993. This poverty rate of 58.1 percent is

⁷The F-test was applied in Table 4, taking into account the design effect.

Table 4. Welfare level comparisons VLSS 1993

		Compo- site indicator human assets	Compo- site indicator physical assets	Compo- site indicator	Expendi- ture per capita
Rural/Urban	Rural	652	1136	894	1162
	Urban	763	2290	1526	2286
Large regions	North	708	1539	1123	1201
	Central	675	1264	970	1233
Seven geographical regions	South	632	1236	934	1754
	Northern Mountains	684	1382	1033	1000
	Red River	722	1634	177	1323
	North Central	721	1122	921	1027
	South Central	643	1517	1081	1507
	Central Highlands	584	893	740	1094
	Southeast	728	1896	1312	2076
	Mekong River Delta	579	875	727	1577
Ethnic group	Kinh	686	1406	1046	1432
	Minorities	600	1120	861	1098
Gender of household's head	Male	675	1340	1007	1304
	Female	673	1441	1057	1613
Type of household	Farm	746	1946	1346	2034
	Non-farm	643	1115	879	1105
Relative income poverty status	Not relative poor	681	1420	1050	1456
	Relative poor	589	637	614	431
Expenditure quintile	E Quintile 1	618	844	730	555
	E Quintile 2	653	1071	862	808
	E Quintile 3	659	1252	955	1050
	E Quintile 4	666	1411	1038	1419
	E Quintile 5	761	2111	1436	2834
Quintile with composite indicator	C Quintile 1	479	305	394	978
	C Quintile 2	640	794	717	1098
	C Quintile 3	695	1222	958	1202
	C Quintile 4	747	1679	1212	1341
	C Quintile 5	808	2834	1820	2306
TOTAL	Mean	674	1367	1020	1387

based on a poverty line of 1,160 thousand VND.⁸ The value of the composite indicator giving the same poverty rate of 58.1 percent is 1062. This is the *relative* poverty line used for poverty comparisons among socioeconomic groups. The second poverty line, a kind of *absolute* poverty line, is built by choosing a poverty threshold for each primary poverty indicator discussed earlier.

The highlights of the comparison of poverty incidence in the VLSS 1993 are indicated in Table 5 and summarized thereafter.

To sum up, Table 5 shows that:

- a) in rural and urban areas, the poverty incidence is the same for asset poverty.
- b) for the seven regions, the poverty rate is quite different for asset and consumption poverty. In terms of consumption, Northern Mountains is the poorest region (78.6%) while Mekong River Delta is the poorest in terms of assets (82.8%). A large difference in consumption poverty between Red River Delta (62.8%) and Southeast (32.7%) is observed. Both regions have the same rate in terms of assets at 41 percent.
- c) globally, the North is significantly less poor in assets than the South and the Central regions while the situation is reverse for the consumption poverty where the South is significantly less poor than the rest of the country.
- d) the gap between male- and female-headed households is lessened in assets poverty, in comparison with consumption poverty.
- e) the substantial poverty rates in quintiles 4 and 5 clearly show that the two concepts of poverty revealed respectively by the composite indicator (assets) and the moneymetric one (consumption) are not equivalent.

⁸ Government-Donor-NGO Working Group (1999), p. 5.

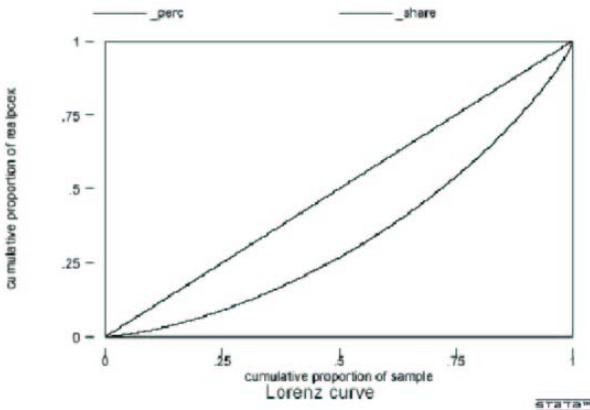
Table 5. Poverty incidence comparisons VLSS 1993

		Poverty composite indicator with absolute line = 1163		Poverty indicator based on 58.1% line = 1062		Poverty moneymetric indicator according to line = 1160 thds VND (58.1%)	
Rural/Urban	Rural	77.1	2	66.5	2	66.4	2
	Urban	29.6	1	24.1	1	24.9	1
Large regions	North	57.7	1	45.5	1	69.4	3
	Central	73.5	2	62.5	2	63.4	2
Seven geographical regions	South	73.6	3	67.9	3	41.9	1
	Northern Mountains	63.8	4	51.3	3	78.6	7
	Red River	53.3	2	41.3	1	62.8	4
	North Central	78.4	5	62.5	5	74.5	6
	South Central	63.4	3	57.1	4	49.6	3
	Central Highlands	91.3	7	82.1	6	70	5
	Southeast	49.5	1	41.4	2	32.7	1
Ethnic group	Mekong River Delta	87.3	6	82.8	7	47.1	2
	Kinh	65.5	1	55.6	1	55.1	1
Gender of household head	Minorities	79.6	2	71.1	2	74.7	2
	Male	69.4	2	59.4	2	61	2
Type of household	Female	61.8	1	53.5	1	48.2	1
	Farm	42.6	1	34.6	2	30.8	1
Relative income poverty status	Non-farm	78.2	2	67.9	1	69.6	2
	Not relative poor	65.4	1	55.3	1	54.6	1
Expenditure quintile	Relative poor	95.4	2	90.9	2	100	2
	E Quintile 1	90	5	82.3	5	100	3
Quintile with composite indicator	E Quintile 2	79.7	4	69.0	4	100	3
	E Quintile 3	70.8	3	58.6	3	90.6	2
	E Quintile 4	62.2	2	52.1	2	0	1
	E Quintile 5	35.6	1	28.3	1	0	1
	C Quintile 1	100	3	100	3	76.4	5
	C Quintile 2	100	3	100	3	71.1	4
	C Quintile 3	100	3	88.4	2	63.7	3
	C Quintile 4	38.4	2	0	1	55	2
	C Quintile 5	0	1	0	1	23.8	1
TOTAL	Mean	67.7		58.0		58.1	

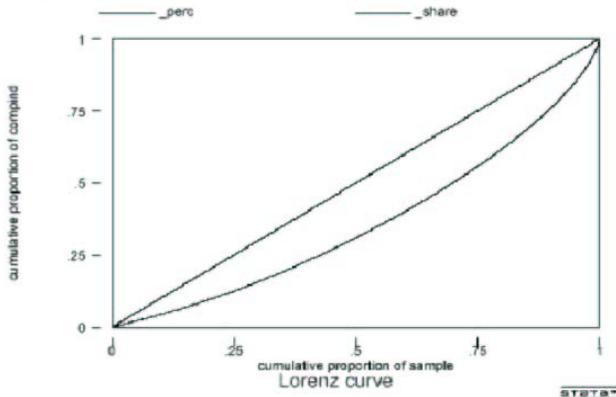
- f) similar conclusions are obtained from the absolute poverty line of 1163, which gives a national poverty rate of 67.7 percent.

As seen in the Lorenz curve shown in Graphs 1a and 1b, it can be observed that at the country level, there is less inequality in assets than in consumption. In fact, the Gini coefficient is 0.284 for the composite poverty indicator and 0.329 for the expenditure per capita. The inequality analysis is shown in Table 6 where the Gini coefficient is computed for different socioeconomic groups as well for consumption and for assets.

Graph 1a. Lorenz curve of expenditure per capita, 1993



Graph 1b. Lorenz curve of composite poverty indicator, 1993



The most striking fact in Table 6 is that inequality increases from North to South, with the inequality differential much larger in assets than in consumption: the Gini coefficient for the composite indicator is 0.356 in the South, compared to 0.213 in the North. Consumption inequality is also stronger in urban areas while it is reverse for assets inequality. For both types of welfare, there is more inequality among the minorities than among the majority group, the Kinh. While there is a stronger consumption inequality in the non-farm sector, such a differential does not exist in terms of assets.

Conclusion for 1993

The most remarkable point in the preceding analysis of a multidimensional poverty concept measured in terms of human and physical assets is that it gives a picture of welfare, poverty and inequality different from the unidimensional consumption approach. It means that both concepts are complementary, even if there is an expected correlation between them.

Table 6. Gini coefficient for consumption and composite poverty indicator VLSS 1993

	Expenditure per capita	Composite poverty indicators
Vietnam	0.329	0.284
Urban	0.337	0.226
Rural	0.278	0.254
North	0.292	0.213
Central	0.306	0.268
South	0.341	0.356
Kinh	0.319	0.273
Minorities	0.364	0.332
Non-farm	0.337	0.263
Farm	0.267	0.251

A multidimensional poverty profile for 1998 and dynamic analysis

For the 1998 profile, the same steps used in the profile for 1993 are applied. Table 7 summarized the results.

The 1998 profile with eight CBMS indicator

Over the period 1993-1998, six of the eight poverty indicators have improved in percentage while two, chronic sickness and adult illiteracy, have not changed significantly. The most important changes are in the lack of communication facilities (-24.2%), underemployment (-15.1%), no simple toilet (-14%) and temporary house (-11.5%). Due to the population growth (+14.4% households), there are more households suffering from functional illiteracy (+7.2%) and especially from chronic sickness (+29.8%).

Analyzing these changes more deeply, it may be noted that:

- the improvement in communication facilities has occurred more in Central Highlands (-35.8%) and less in Northern Mountains (-14.8%) as well as among the minorities (-12.6%);
- underemployment has decreased at a high rate in two of the three regions having the highest rates, North Central (-27.2%) and Red River Delta (-23.8%), the third one, Mekong River Delta, remaining high with a small decrease of only -4.1 percent;
- sanitation has improved strongly in North Central but less than the average in Mekong River Delta, where it was and remains the most deficient. Minorities have been particularly performant on this aspect;
- reduction of temporary housing has been particularly spectacular in Central Highland (-30.8%) but very low in Mekong River Delta (- 6.2%), which remains by far the most deficient region on this regard;
- adult illiteracy has decreased significantly in Central Highlands (-17%), where it had the highest rate in 1993,

Table 7. Multidimensional poverty in 1998 and variation 93-98 (%)

		1998	Variation 1993-1998
Underemployment	No underemployment	71.1	15.1
	Underemployment	28.9	-15.5
Chronic sickness	No chronic sick	79.4	-2.5
	Withchronicsick	20.6	2.5
Adultilliteracy	Adults literate	60.8	2.3
	Adults illiterate	35.2	-2.3
Underschooling	Children going to school	91.6	6.7
	Children not going to school	8.4	-6.7
Without radio, TV	Without radio, TV	28.8	-24.2
	With radio, TV	71.2	24.2
Type of dwelling	Permanent house	15.7	-0.8
	Semi-permanent house	59.2	12.2
	Temporary house	25.0	-11.5
Drinking water	Piped, rain, drilledwell	41.0	14.8
	Dug well	43.2	-9.5
	Pond, lake, river	11.4	-7.9
	Others	4.4	2.6
Sanitation (Types of toilet used)	Flush toilet	17.0	6.6
	Double vault compost latrine	9.8	1.4
	Simple toilet	39.7	5.9
	Other types	13.6	-7.2
	No toilet	19.8	-6.8

and which is at the same level in 1998 than Mekong River Delta, whose improvement has been only -3.7 percent;

- chronic sickness has decreased spectacularly in Southern Central region (- 15.2%) but more than doubled in Southeast region (+ 9.9%) and almost doubled in Red River Delta (+9.6%).

From this analysis, it is seen again that the dynamics of multidimensional poverty would be easier to observe with a composite poverty indicator.

The 1998 profile with a composite indicator and comparative analysis with the moneymetric approach

As stated above, a multidimensional composite poverty indicator has been computed for 1998 on the basis of the category weights established for 1993. In contrast to a moneymetric indicator, no price adjustment is required for such a categorical based indicator. The same remark applies for poverty lines built on the basis of the composite indicator.

Multidimensional welfare level comparisons and dynamics from 93 to 98

Table 8 is similar to Table 4, with an additional component, the variation in percentage from 1993 to 1998. This variation is given for the two components of the composite indicator, the human and physical assets sub-indicators. Regarding the moneymetric analysis, 1998 real expenditure per capita has been deflated taking 1993 as the basis. The deflator takes the value 1.225, as given in the official 1999 report.⁹

As seen in Table 8, the assets welfare improved by 21 percent in the period 1993-98. Said improvement is higher for physical than for human assets. During the same period, consumption welfare increased by 76 percent but this general improvement has not been equally distributed among the different socio-economic groups.

The rural area experienced a higher improvement rate in assets than the urban area. A reverse situation for the consumption welfare, however, was noted with a lower improvement rate in rural area. The gap of 1,124 thousand VND in 1993 doubled to 2,335 thousand VND in 1998.

Geographically, in terms of assets, the North has kept its advance over the rest of the country, with approximately the same gap. Some important changes have occurred though in the seven regions. Even if the extreme ranks have not changed, the gap has been reduced

⁹ See Government-Donor-NGO Working Group (1999), annex 2, p. 163.

Table 8. Welfare level comparisons in 1998 and variation 1993-1998

	Composite indicator human assets		Composite indicator physical assets		Composite indicator		Expenditure per capita	
	1998	% 93-98	1998	% 93-98	1998	% 93-98	1998	% 93-98
Rural/Urban								
Rural	701	7.4	1452	27.8	1077	20.4	1878	62
Urban	777	1.8	2689	17.4	1733	13.5	4213	84
Largeregions								
North	758	7.1	1956	27.1	1357	20.9	2150	79
Central	721	6.7	1560	23.4	1140	17.6	2038	65
South	670	6.1	1656	34	1163	24.5	3127	78
Seven geographical regions								
Northern Mountains	734	7.2	1563	13.1	1148	11.2	1713	71
Red River Delta	776	7.5	2251	37.7	1514	28.6	2479	87
North Central	746	3.6	1607	43.2	1176	27.7	1928	88
South Central	700	8.9	1583	4.3	1142	5.7	2292	52
Central Highlands	671	14.9	1265	41.7	968	30.8	1684	54
Southeast	739	1.6	2396	26.4	1568	19.5	4485	116
Ethnic group								
Mekong River Delta	628	8.5	1202	37.4	915	25.8	2292	45
Kinh	733	6.8	1824	29.8	1279	22.3	2150	78
Minorities	635	5.8	1295	15.7	965	12.2	1766	61
Gender of household head								
Male	724	7.2	1709	27.6	1216	20.8	2268	74
Female	706	4.8	1863	29.3	1284	21.6	2918	81
Type of household								
Farm	743	-0.5	2210	13.6	1476	9.7	3448	70
Non-farm	704	9.5	1463	31.2	1084	23.3	1812	64
TOTAL	719	6.6	1750	28	1234	21	2439	76

between the first and the second. With a 28.6 percent increase, Red River Delta has almost caught up with the Southeast whose improvement was only 19.5 percent. North Central, with above average performance, especially in physical assets, has climbed from rank 5 to rank 3 while South Central, with a performance largely below the average as well in human and physical assets, has passed from rank 3 to rank 5.

In terms of consumption, the geographical performance, however, is another story. The gap between the South and the rest of the country has doubled due to an exceptional performance of Southeast (116%), compensating for the lowest increase experienced by Mekong River Delta (45%), which came down to rank 3, behind Red River Delta. The latter climbed from rank 4 to rank 2. Nevertheless, the consumption gap between Southeast and Red River Delta has tripled.

Socially, the Kinhs have benefited more from the general welfare improvement and the gap with the minorities in terms of assets, mostly physical and consumption, has increased. The gender gap, meanwhile, has significantly increased only in terms of consumption in favor of female-headed households. Meanwhile, the latter has remained very low and not really significant in terms of assets.

Farming households have performed better than non-farming ones in human and physical assets so the asset gap has been reduced. On the other hand, the consumption gap has almost doubled.

Multidimensional poverty and inequality analysis in 1998 and variation from 1993 to 1998

Table 9 has to be analyzed in connection with Table 5. It shows that the assets poverty rate has decreased by approximately the same percentage points (20%) as the consumption poverty rate from 1993 to 1998.

Geographically, not only has the North kept its advance over the South in terms of assets poverty but the poverty gap between both parts of the country has increased. The Central region, with the best performance, has distanced from the South to become midway

Table 9. Poverty incidence comparisons in 1998 and variation 93-98 (%)

	Poverty composite indicator with absolute line=1062 (base 1993)		Poverty moneymetric indicator according to line=1790 thousands VND	
Rural/Urban				
Rural	46.0	-20.4	45.5	-20.8
Urban	13.6	-10.4	9.2	-15.8
Largeregions				
North	26.0	-19.5	42.9	-26.5
Central	39.4	-23.1	43.8	-19.6
South	52.3	-15.6	26.0	-15.9
Seven geographical regions				
Northern Mountains	42.1	-9.2	58.6	-20.0
Red River Delta	11.3	-30	28.7	-34.1
North Central	31.6	-30.9	48.1	-26.4
South Central	44	-13.1	35.2	-14.4
Central Highlands	54.8	-27.3	52.4	-17.6
Southeast	23.8	-17.6	76.0	-25.1
Mekong River Delta	69.2	-13.6	36.9	-10.2
Ethnic group				
Kinh	34.0	-21.6	31.7	-23.4
Minorities	63.3	-7.8	66.9	-7.8
Gender of household head				
Male	39.4	-20	39.9	-21.1
Female	36.6	-16.9	28.2	-20.0
Type of household				
Farm	28.0	-66	19.5	-11.4
Non-farm	45.3	-22.6	48.2	-21.4
TOTAL	38.8	-19.3	37.4	-20.7

between the North and the South. This stronger performance of the North is essentially due to Red River Delta, where the assets poverty rate reduction has almost doubled the one achieved in Southeast. The extreme ranks have not changed but an important gap has appeared between Red River Delta (by far the first at 11.3%) and Southeast, still second, at 23.8 percent. North Central, the best performing region, has passed from rank 5 to rank 3.

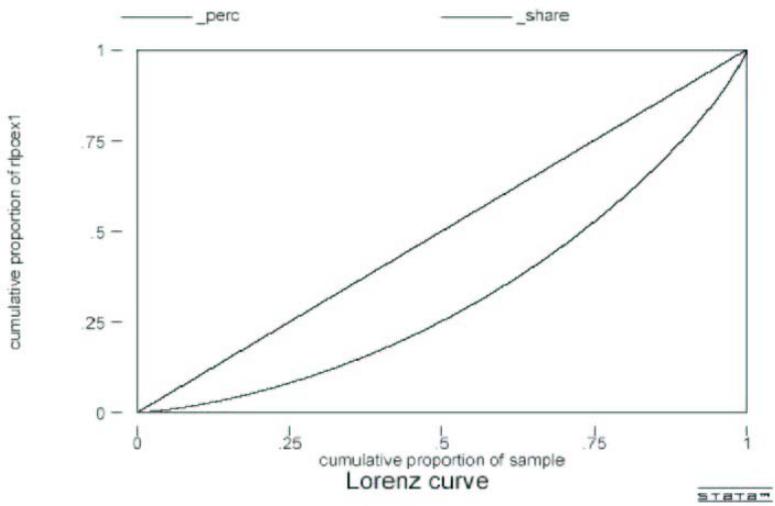
In terms of consumption poverty reduction, there has been a relatively similar pattern. The North has performed better than the South, and the poverty gap has been reduced from 28 to 16 percentage points. Again, Red River Delta registered the highest performance, passing from rank 4 to rank 2 while the lowest one was in Mekong River Delta, which went from rank 2 to rank 4. The main difference is the very good performance of Southeast, which reduced its consumption poverty rate to a very low 7.6 percent.

Socially, the Kinhs have achieved a poverty reduction rate three times higher than the minorities, as well in assets and consumption. The poverty gap between both groups has widened, from 20 percentage points to 30 and more. Male- and female-headed households performed almost equally in both types of poverty reduction while farming households performed much better than non-farming ones in both types of poverty reduction.

From the Lorenz curve given in Graphs 2a and 2b, and comparing with Graphs 1a and 1b, the inequality differential between consumption and assets is seen to have increased from 1993 to 1998. Assets inequality has decreased while consumption inequality has increased. In fact, as can be seen from Table 10, the Gini coefficient for consumption has increased from 0.329 to 0.350. For assets, it has decreased from 0.284 to 0.241. Thus, the remarkable improvement since 1993 in both types of welfare, consumption and assets, has been accompanied by an opposite effect in inequality: more consumption inequality but less assets inequality.

The increase in consumption inequality did not occur exclusively in either rural or urban areas. It occurred as well in the North, Center

Graph 2a : Lorenz curve of expenditure per capita, 1998



Graph 2b : Lorenz curve of composite poverty indicator, 1998

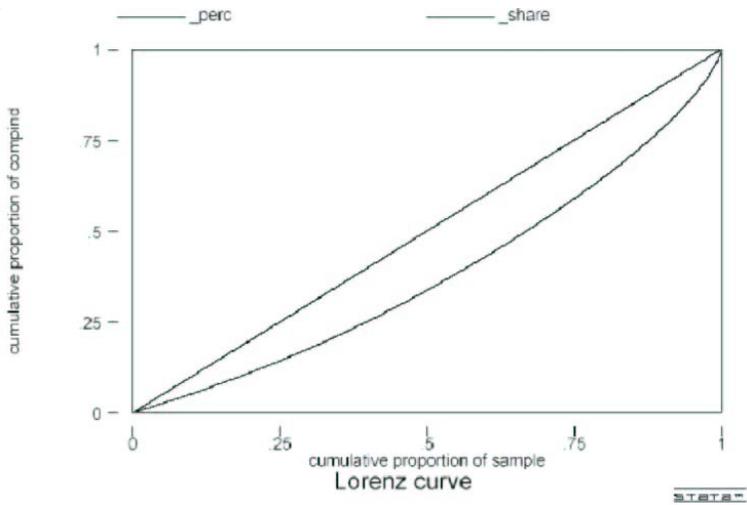


Table 10. Gini coefficient for consumption and composite poverty indicator VLSS 1993 and 1998

	Expenditure per capita		Composite poverty indicator	
	1993	1998	1993	1998
Vietnam	0.329	0.350	0.284	0.241
Urban	0.337	0.340	0.226	0.173
Rural	0.278	0.270	0.254	0.215
North	0.292	0.321	0.213	0.195
Central	0.306	0.315	0.268	0.210
South	0.341	0.367	0.356	0.299
Kinh	0.319	0.339	0.273	0.229
Minorities	0.364	0.359	0.332	0.268
Non-farm	0.337	0.361	0.263	0.239
Farm	0.267	0.259	0.251	0.207

and South but neither within the minorities nor the farming households. The reduction of assets inequality has been general across the different socioeconomic groups. Assets inequality is particularly low in the urban area (0.173) and in the North (0.195).

Conclusion for 1998

The multidimensional poverty analysis, with a composite indicator based on human and physical assets, confirms the extensively analyzed trend from a moneymetric consumption perspective, of a general remarkable improvement during the period 1993-1998. The global reduction of poverty is approximately at -20 percent, from both perspective. The dynamics, though, have been different, according to the two approaches to poverty. A striking fact is that inequality in consumption, already higher than assets inequality in 1993, still increased while inequality in assets decreased. The regional differential in assets poverty has increased in favor of the North, already ahead of the South in 1993. Consumption poverty also decreased in favor of the North, which was far behind the South in 1993. The South nevertheless still leads in terms of the general consumption level and the rate of consumption poverty.

Conclusion

Eight simple non-monetary, categorical indicators of human and physical assets developed in the CBMS research in Vietnam have been identified in the VLSS-1993 and 2 survey data sets. They have been analyzed and aggregated in a composite indicator using the factorial technique called the Multiple Correspondence Analysis. Categorical were computed for the eight indicators, 21 categories, of which the composite indicator relies on, with 1993 as the base year and kept the same for 1998.

The comparison of this multidimensional approach to poverty measurement with the moneymetric approach yields certain convergences such as:

- a) in the base-year 1993, with the 58 percent global moneymetric poverty rate as a benchmark, poverty rates are comparable for both methodologies across the rural/urban and ethnicity classifications (Table 5);
- b) the female-headed households are less poor than the male-headed ones (Table 5);
- c) the inequality is higher from North to South, as well as in 1993 and 1998 (Tables 6 and 10);
- d) in terms of poverty dynamics, the poverty rate has decreased by the same amount, minus 20 percent (Table 9). This is the most striking convergence fact between both measurement methodologies;
- e) the remarkable success in poverty reduction has globally been greater in the North than in the South for both types of poverty (Table 9).

On the other hand, there are also many divergence facts:

- a) the regional incidence of poverty is reverse according to the two types of indicators: from North to South, *monetary (consumption) poverty decreases while multidimensional asset poverty increases* in 1993 and 1998 (Tables 5 and 9).

- A different ranking of the seven regions (and significantly different poverty differentials) is attained;
- b) as a general result of the performance of the North, the multidimensional asset poverty differential between the North and the South has increased while the consumption poverty differential has decreased (Tables 5 and 9);
 - c) the differential between male- and female-headed households is larger for consumption poverty in 1993 (Table 5) and still much larger in 1998 (Table 9) than for multidimensional poverty;
 - d) while the consumption inequality has globally increased from 1993 to 1998, the multidimensional asset poverty has decreased, particularly in the Central and South regions, where it nevertheless remains higher than in the North part of the country (Table 10).

Taking into account the different concepts of poverty measured by both methodologies, these convergence and divergence facts seem confirmed by the real situation as observed in the field. It must be kept in mind that *the multidimensional composite indicator includes a strong component of human assets (education and health)*, partly built through community facilities, and here the divergence facts can find an explanation. On the other hand, the owning of many of the assets included in this composite indicator is related to income, essentially to permanent income (what the expenditure approach tries to catch) and this can help to explain the convergence facts. In fact, the correlation between both indicators while highly significant, is not so high at approximately 0.49 in both years 1993 and 1998. It thus appears that *the multidimensional poverty composite indicator reveals a face of poverty different than the one expressed through the expenditure indicator— not in an opposite but rather complementary way.*

This type of *measurement of multidimensional poverty has a great advantage*: being based on a set of categorical or qualitative

simple indicators, it avoids the important difficulties of a price-based moneymetric indicator, especially for poverty analysis across time and space. It is not, however, a panacea to the challenge of measuring poverty. There are some major caveats and sensitive issues to consider, among which:

- a) The choice of the primary indicators is not obvious. It should be explicit, which aspect of poverty each one is supposed to reveal. They must also be meaningful across the socioeconomic groups, especially across the rural/urban areas and the different ecological regions. Housing characteristics, safe water, etc., are difficult to measure so that they are comparable across the whole country. But this is true of any analysis variable in a national household survey;
- b) Poverty line determination does not rely on any strong theoretical ground. It does not mean that it is completely arbitrary but the rational supporting the choice needs to be clear. The *relative approach* of a quantile exogenously determined, as done here in the base year 1993, is interesting to compare different methodological and conceptual approaches to poverty. The *absolute approach* of fixing a poverty line for each primary indicator is not to be excluded. With binary indicators, there is no arbitrariness. With non-binary ones, the selected threshold can represent a consensual social choice in terms of a standard to achieve in terms of poverty eradication, for example, in terms of sanitation facilities, safe water, housing characteristics, etc. Whatever the approach, this base poverty line must obviously be kept constant across time for the dynamic analysis of poverty changes;
- c) The base categorical weights are also to be kept constant, as for the computation of a CPI relative to a fixed basket of goods.

This short list is far from being exhaustive.

The research presented here could be pursued in trying to expand the list of basic indicators from the variables available in the sequence of VLSS surveys, including the third one completed in 2002. In particular, some light, non-monetary indicators of poverty dimensions not explicitly represented here, like nutrition, could be looked into. For an annual monitoring of poverty, some more short-term sensitive indicators should also be looked at.

To conclude, the CBMS type indicators present a strong analytical potential for multidimensional poverty analysis, being complementary to the more standard moneymetric analysis. In addition, due to their ease of use and their low cost, they should be looked into to meet the objective of regularly producing largely disaggregated poverty profiles for a more efficient monitoring of poverty reduction policies and programs. Some very simple questions may also be integrated in the national censuses with the view of mapping poverty at the lowest level with a national coverage.

This does not preclude the usefulness of these indicators at the level where they have first been designed of course, which is at the community level, for poverty targeting through local development interventions. The weights developed at a national level can easily be used within small communities to rank the households according to their multidimensional poverty level and thus enhance the efficiency of CBMS.

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Comments

- The paper presents a very interesting exercise in multidimensional poverty measurement. Methodologically, it relies on an infrequently-used type of factor analysis (in poverty assessment), multiple correspondence analysis, to construct a composite indicator. Empirically, it shows that there is imperfect correlation between consumption expenditure/consumption poverty and 'multidimensional poverty' across regions and population groups, though trends tend to be in the same direction. As such, the paper makes an important contribution to multidimensional poverty analysis.
- The relationship between the analysis of VHLSS data presented in the paper and the MIMAP survey data could be made more explicit. It is clear that the eight indicators used in the analysis were drawn from the MIMAP survey but it is not clear how the analysis presented serves to "assess the relevance" of these indicators (footnote #4). The results show that multidimensional poverty and consumption poverty are imperfectly correlated which is a common finding but this is not the same as assessing the relevance of the MIMAP indicators.
- There are two issues which all composite indicators must address: 1) inclusion/exclusion issues; and 2) weighting of the variables included. On the first issue, as the authors acknowledged, there is no justification for the indicators selected other than that they were included in the MIMAP survey. This poses problems because the worth of the composite indicator ultimately depends on the worth of its component parts. Two ways to address this in the future could be: 1) statistical valuation, whereby good predictors/proxies of income, education, health, etc., are selected as in

poverty mapping; and 2) normative valuation, whereby people are asked about the dimensions of well-being that are the most important to them and the results are aggregated (this could be done in either focus groups or a survey).

- The paper would be strengthened if an explicit justification was provided for the use of multiple correspondence analysis (MCA) as opposed to other types of factor analysis such as principle components analysis (PCA) or other types of statistical analysis. It would be further strengthened if a sensitivity analysis was conducted to determine if the main findings are robust to the choice of statistical technique in weighting the component variables in the indicator.
- While the authors clearly state that they are not addressing policy issues in the paper, a number of points are relevant here. First, the case for undertaking this type of analysis would definitely be strengthened if its policy relevance were made explicit. There are two problems with composite indicators as a direct guide to policy. One is that they rely mainly on outcome indicators (or their proxies) which makes it hard to use them to directly assess public policy or programs due to attribution problem. And two is that they are potentially useful as a guide for resource allocation or targeting purposes but not for sectoral policy or programming where detailed information on specific components of the composite indicator, e.g., health or education, is required. Composite indicators 'aggregate away' the key information required. The potential relevance for targeting or resource allocation for is seen: multidimensional targeted programs, with components spanning the different sectors, integrated rural development projects or social fund/ community action plan type schemes. Discussion of these types of issues would make a stronger case for the methodology used.
- The sample size is quite huge since all households in each commune were surveyed.

- Provide information if there is a relationship between underemployment as defined here and consumption poverty, especially in rural Vietnam. The fact that the underemployment/poverty relationship does not seem to hold across the ethnic disaggregation raises question. Often, in countries where poverty is mainly a rural phenomenon, it is the time rate of unemployment (TRU), and not underemployment or open unemployment, that is the key.
- The way the question on sickness was posed often leads to a self-report bias because poor/disadvantaged groups do not consider sickness as such. For them, it is just the normal state of affairs. The lack of statistically significant results in the cross-tabulations involving sickness may be due to this reason.
- Provide comparison between the permanent/semi-permanent/temporary distinction of housing structure and the type of roof material, construction materials, etc., as a discriminator of poverty status in Vietnam.
- The tables containing the disaggregation results are discussed but not presented.
- An intuitive explanation of the meaning of the category weights should be provided to help in the interpretation of results.
- Interpreting the application of the 'relative poverty line' to the composite indicator is unclear. This line is really based on the poverty incidence figure 58% associated with the consumption poverty line, calculated using the food share method (nutritional anchor plus an allowance for non-food). This is not a relative poverty line and the incidence figure of 58% does not have any particular meaning outside its application to the consumption poverty line. It would be a more meaningful comparison if a relative poverty line were applied to both, say looking at the bottom x percent of the consumption and composite indicator distribution and seeing how the results differed.

- Some points that were suggested to be included were:
 1. Questions on perceptions of change over the past year for the key areas of investigation (income, health, and education) and subsequent analysis of the relationship between perceptions of change and trends based on indicator changes.
 2. Follow-up questions on the reasons for perceived change in the key areas of investigation.
 3. A ranking of the perceived priorities for public policy or programming in the key areas.
- All the CBMS network countries should try to compare moneymetric poverty and inequality indices, physical and human capital poverty and inequality indices and perception poverty and inequality indices over time.
- What is interesting to see here is the dramatic reduction in human and physical assets poverty and inequality for the urban and more developed part of Vietnam and increasing inequality in terms of consumption. The reason for this is the return to human capital in terms of income (moneymetric) poverty and that inequality would be greater in the more urban developed part even though remarkable reduction in the inequality in human and physical assets is seen due to the demand in skills in tight labor market and rising wages.
- Interpreting composite index to local or national planners may be more difficult. However, moneymetric indicators may be easier to understand.